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Impacts of CERCLA (Comprehensive Environmental Response, Compensation and Liability Act) Release Notification Requirements on Transportation of Products Containing Hazardous

(U.S.) Transportation Systems Center
Cambridge, MA

Prepared for

Environmental Protection Agency, Washington, DC

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Impacts of CERCLA Release Notification Requirements on Transportation of Products Containing Hazardous Substances

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August 1986
Final Report

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16. Abstract

In order to determine the regulatory burden imposed by CERCLA release-notification requirements on shippers and carriers handling products containing hazardous substances, eight shippers and seven carriers were interviewed in depth during the summer of 1983. The interviews were structured to elicit information regarding the volume and types of shipments of hazardous materials and hazardous substances, staffing required, training costs and procedures, paperwork burdens, and insurance costs.

There was a general consensus that CERCLA would have very little impact on product shipment costs because: (1) nearly all high-volume, CERCLA-listed substances were already subject to federal Hazardous Material Regulations; (2) those products not previously listed were of little importance in commerce; and (3) nearly all firms handling these substances already had on board appropriate staff to deal with the new regulations.

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Hazardous Substance, Hazardous Material, CERCLA, Transportation Cost, Shipper, Carrier

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PREFACE

This report is one of a group of studies dealing with various aspects of the hazardous substance spill problem in transportation. The study was performed by the Transportation Systems Center (TSC), Cambridge, MA under the sponsorship of the U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. The TSC investigators are grateful to Dr. Jack Kooyoomjian, sponsor, Barbara Hostage, Ann Barksdale, and Richard Horner for their assistance.

The other studies conducted under this contract in FY 1983 included: (1) an analysis of the distribution of spill sizes, (2) an assessment of the risks associated with pressure-relief devices, and (3) the development of several new spill reports.

Robert Walter of TSC's Operator/Vehicle Systems Division was Project Manager. These studies were an outgrowth of previous spill analyses performed by Paul Hoxie and Donna Woodman dealing with risks associated with unmarked packages and with multiple package shipments in FY 1982.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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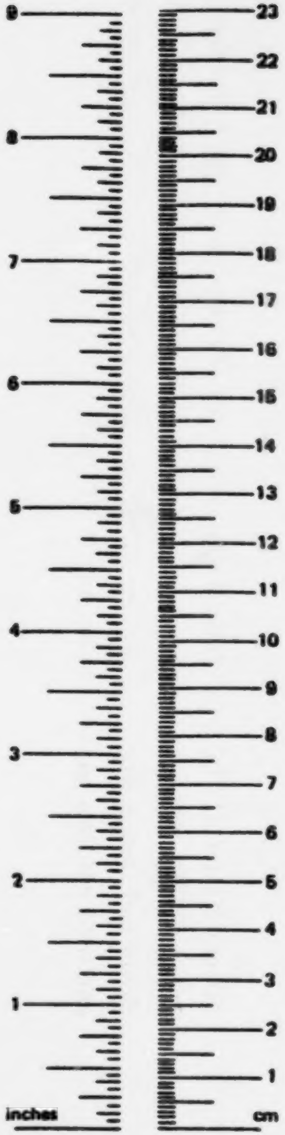
*1 in. = 2.54 cm (exactly). For other exact conversions and more detail tables see NBS Misc. Publ. 286. Units of Weight and Measures. Price $2.25 SD Catalog No. C13 10 286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

°F
32
98.6
°F
212
−40
0
40
80
120
160
200
−40
−20
0
20
40
60
80
100
°C
37
°C

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ABBREVIATIONS AND SYMBOLS

ANPRM	Advanced Notice of Proposed Rulemaking
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CWA	Clean Water Act
DOT	Department of Transportation
HMR	Hazardous Materials Regulations
HMTA	Hazardous Materials Transportation Act with Amendments
MTB	Materials Transportation Bureau
NRC	National Response Center
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
STCC	Standard Transportation Commodity Classification
TSC	Transportation Systems Center
UN	United Nations

Executive Summary

In compliance with established Federal policies requiring an assessment of the affects of all new regulations, the Environmental Protection Agency initiated a number of studies concerning the impacts of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The Transportation Systems Center was engaged to investigate the consequences of CERCLA for the shipment of products containing hazardous substances. Among the principal objectives of this study were assessment of the following:

1. The proportion of shipments affected by CERCLA, especially the proportion subject to regulation for the first time because of CERCLA;
2. Staffing required for compliance with CERCLA;
3. Paperwork costs;
4. Incidental costs such as training, insurance, etc.;
5. Changes in spill clean up practices and policies.

Since budgetary constraints precluded a large-scale survey, the approach chosen was that of the face-to-face interview with shipper and carrier personnel most immediately affected by Federal regulations concerning hazardous shipments. Interviews of one to three hours duration were conducted at the offices of eight shippers and at seven carriers. The individuals chosen were selected to represent a broad range of firm sizes, functional specializations, degree of hazard in products handled, and some geographic diversity. However, in light of the very small numbers of firms in the study, it must be recognized that some of the possible effects of CERCLA may not have shown up in the sample population.

Because final determinations of RQs (reportable quantities) for CERCLA-listed substances had not been made at the time of the interviews, respondents were asked to consider the RQ's proposed in the Federal Register of May 25, 1983 as final, and to assume that massive forms of metals and their compounds were exempt from RQ labelling requirements. They were also instructed to assume that final RQs for the remaining CERCLA substances would be set at levels reasonable for the degree of hazard they possessed.

Subject to the above caveats, the principal conclusion emerging from this survey was that CERCLA will impose relatively small costs on the transportation of products containing hazardous substances. Most respondents agreed that the costs of CERCLA on product shipments would be too small to measure. They noted the following reasons for this:

1. Virtually all of the high-volume products listed under CERCLA were already subject to Federal Hazardous Material Regulations (HMR). Thus, the only new requirements imposed by CERCLA are the stamping or printing of "RQ" on shipping labels as appropriate and spill reporting to the NRC.

2. The products proposed for listing under CERCLA which have not previously been subject to HMR are of relatively little importance in commerce. The general view was that products containing newly listed substances subject to RQ labelling requirements make up less than 0.1 percent of all hazardous shipments.

3. All survey respondents, but the smallest, had established procedures and personnel to deal with hazardous shipments. In no case was there any distinction or special staffing required for hazardous substances as opposed to hazardous materials. Thus the activities mandated by CERCLA were universally viewed as incremental expansions of existing duties which would not require additional staffing.

4. The principal burden imposed on product shipping activities as a result of CERCLA and its incorporation into Federal Hazardous Materials Regulations is simply the labelling of packages or containers with "RQ". For most large firms, this requires only minor changes to software used in the shipping department. Where shipping paperwork is processed manually, clerks will have to check manuals, tables, etc., at least until they commit the RQ information to memory. Even this manual method was regarded as being of negligible cost.

1.0 INTRODUCTION

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA, also known as "Superfund") established broad federal authority to deal with releases or possible releases of hazardous substances both at fixed facilities and in transit. Six hundred and ninety-six substances, including many of the most widely used chemicals in industry and agriculture, were designated as hazardous in the Act and the EPA was granted authority to specify additional substances.

Among the numerous provisions of the Act, the ones having greatest impact on routine operations in the transportation sector are those relating to the reporting of releases of the designated substances and those which establish the mechanisms by which carrier personnel may be made aware that a given shipment contains a sufficient quantity of a hazardous substance to be reportable should a release occur. Specifically, since publication in the Federal Register of May 22, 1980, shippers and carriers were required to stamp or print "RQ" on every package or container in which a quantity of a hazardous substance is present equal to or greater than the reportable quantity (RQ) established by EPA regulations and listed in the Hazardous Materials Tables. The Act set statutory RQ's for hazardous substances of 1, 10, 100, 1000 or 5000 pounds. EPA was granted authority to adjust RQ's both under CERCLA and the Clean Water Act, while the statutory language of CERCLA allows EPA considerable discretion in assigning RQ's of hazardous substances. The Agency takes into explicit consideration the intrinsic physical and chemical properties of substances and their aquatic toxicity, mammalian toxicity, ignitability, reactivity, chronic toxicity (also referred to as other toxic effects), carcinogenicity, biodegradability, hydrolysis and photolysis.

All Federal agencies that prepare regulations must comply with Presidential Executive Order 12291. This Executive Order requires that the regulatory burden of regulations be examined and that the alternative which produces the lowest net cost (or highest net benefits) be identified. In its initial analyses of the regulatory burden of spill notification requirements, EPA staff concluded that the impact was "non-major" under the OMB definition (i.e., the effect on the U.S. economy will be less than $100 million per year, will cause no major cost increases, nor have significant adverse effect on competition, productivity, etc.).

Since that initial determination of non-major impact, however, several questions have arisen about possible costs imposed by CERCLA as DOT moves toward integrating the CERCLA regulations into its Hazardous Materials Regulations (HMR). Among these are the extent to which various types of transportation firms and shippers will be subjected to federal shipping regulations for the first time because of CERCLA's implementation into the HMR and how their insurance costs might change. Assessment of the incremental effort in preparing shipments to comply with CERCLA was also needed. To find answers, EPA initiated two contracts, one dealing with waste shipments, being conducted by Abt Associates and the other with product shipments, conducted by TSC. This staff study is one of several resulting from the latter.

1.1 OBJECTIVES

In order to resolve the aforementioned uncertainties regarding the impacts of CERCLA as it is implemented by DOT into the HMR as well as to discover possible unforeseen effects and to solicit suggestions from shippers and carriers, TSC undertook a series of interviews. Because the number of firms in each group was restricted to less than ten, the interviewees were selected so as to promote the maximum flow of information. All of the interviews were held at the respondents' facilities at a time convenient for the person(s) being interviewed. As a result, most discussions lasted one to two hours, with some reaching three hours.

The interview forms (see Appendix A for completed shipper forms, Appendix B for carriers) were designed to ensure the collection of certain basic information across the entire sample group. On each question, however, respondents were encouraged to offer any information which could improve the government's understanding of potential shipper or carrier problems.

The basic questions asked of all respondents addressed the following topics:

- annual volume of hazardous materials shipments by mode
- annual volume of hazardous substance shipments by mode
- staffing for hazardous shipments
- training of personnel
- paperwork costs
- insurance and other miscellaneous costs associated with hazardous shipments.

All respondents were also asked to describe their experiences in dealing with spills and their spill-reporting practices.

In these discussions, respondents were asked to bear in mind certain distinctions, which also apply to this report in its entirety. The first of these is that only the effects of CERCLA on product shipments are to be considered here. Many respondents commented that they anticipated substantially larger impacts on their waste shipments, but these issues were not explored.

The second distinction has to do with the difference between hazardous substances which came under federal regulation for the first time because of CERCLA and those which were previously affected by the Hazardous Materials Regulations (HMR). The former are referred to as "newly designated substances" throughout this report and are the subject of the respondent comments (if any) in the right-hand column of the interview forms (see Appendices A and B). CERCLA-listed substances, which were previously listed in HMR, are grouped with all other hazardous materials in the left-hand column on the interview form.

1.2 DEFINITION OF TERMS

The following definitions are provided to acquaint the reader with several of the critical terms used in connection with the implementation of CERCLA as it affects transportation.

1. "Hazardous material" - a substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. Any material exhibiting any of the hazardous characteristics defined in Section 173 of CFR 49 is a hazardous material regardless of whether it is specifically listed in Section 172.

2. "Hazardous substance" - any substance designated as hazardous under Section 101(14) of CERCLA (see Appendix C for listing). Under DOT regulations "hazardous substance" means a material, and its mixtures or solutions, that is identified by the letter "E" in Column 1 of the Table to § 172.101 of CFR 49 when offered for transportation in one package, or in one transport vehicle if not packaged, and when the quantity of the material therein equals or exceeds the reportable quantity (RQ). Ths definition does not apply to petroleum products that are lubricants or fuel; or to a mixture or solution containing a material which is exempt under the "mixtures and solutions rule" defined below.

3. "Mixtures and solutions rule" - mixtures or solutions of hazardous substances are exempt from the requirements of CERCLA if the concentration of each hazardous component is less than its respective limits specified in the following table.

		Concentration by weight	
RQ pounds	RQ kilograms	Percent	PPM
5000	2270	10	100,000
1000	434	2	20,000
100	45.5	0.2	2,000
10	4.54	0.02	200
1	0.45	0.002	20

4. "Release" - Congress defined the term "release" to include within its

scope virtually all ways that substances may enter the environment: "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment (Section 101(22)).

Four types of releases are specifically excluded from the definition of release in CERCLA Section 101(22). They are:

a. Releases which result in exposures to persons solely within a workplace for which claims against the employer or other persons are available;

b. Emissions from engine exhaust from a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station;

c. Releases of source, byproduct, or special nuclear material from a nuclear incident subject to requirements of the Nuclear Regulatory Commission for financial responsibility under Section 170 of the Atomic Energy Act; and

d. The normal application of fertilizers.

A key element of the definition of "release" is the phrase "into the environment." Although the word "environment" is broadly defined in Section 101 (8), some releases of hazardous substances may not enter the environment. For example, the spill of a hazardous substance onto the concrete floor of a manufacturing facility may not, for notification purposes, be "into the environment" if wholly contained in the facility. If part of the substance does enter the environment, e.g., seeps into the ground or volatilizes into the atmosphere, there would be a release into the environment and, if released in a quantity equal to or greater than the reportable quantity for that substance, the release would be subject to notification requirements of Sections 103 (a) and (b).

The legislative history of the Act indicates that the "workplace exposure" exclusion was apparently intended to limit the potential scope of third-party actions for personal injuries under the Act (see Sen. Rep. 96-848, 96th Cong. 2d Sess. 94 (1980)). The third party action provision was subsequently deleted; however, the "workplace exposure" provision remained. Whether the release results in exposures to persons solely within a workplace does not appear to be relevant in determining whether notification is appropriate. For notification, the Agency believes that the distinction between "facility" (or "vessel") and "environment" is the determining factor; releases from a facility (or vessel) that enter the environment are reportable events.

5. "Newly listed substance" - a hazardous substance which was not previously listed as a hazardous material, i.e., one which comes under regulation for the first time because of CERCLA. These are the substances which appear in Appendix C without a DOT number (indicated by an asterisk) or known to qualify as hazardous under DOT regulations (indicated by a double asterisk). It is possible that a number of the substances shown in Appendix C without an asterisk or double asterisk are in fact subject to the HMR, but have never been listed in Section 172 of CFR 49 because they are of so little importance in commerce.

1.3 HISTORY OF CERCLA

The following excerpt from the Materials Transportation Bureau's ANPRM of August 8, 1983, summarizes the legal background against which CERCLA will affect the transportation sector:

> The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), also known as the "Superfund" law, is the major Federal legislation designed to address the need for a comprehensive system to respond to releases of hazardous substances into the environment and to impose liability for them on responsible persons (42 USC 9601 et seq.). While a principal focus of concernunder CERCLA has been releases from hazardous waste disposal facilities, the law also applies extensively to the transportation of hazardous substances. (See, for example, 42 USC 9601(9).)

The comprehensiveness of CERCLA is indicated by the breadth of the definition of the term "hazardous substance," which includes substances designated by Environmental Protection Agency (EPA) under six separate statutory authorities:

1. Section 311 of the Clean Water Act (CWA);
2. Section 3001 of the Solid Waste Disposal Act;
3. Section 307(a) of the CWA;
4. Section 112 of the Clean Air Act;
5. Section 7 of the Toxic Substances Control Act; and
6. Section 102 of CERCLA.

In order to coordinate the implementation of CERCLA with the Department's administration of the Hazardous Materials Transportation Act (HMTA), Congress adopted Section 306(a) of CERCLA (42. U.S.C. 9656), which provides that each substance that is listed or designated as a "hazardous substance" under the Act shall be listed as a "hazardous material" under the HMTA. Section 306(a) provides that with certain exceptions, carriers of CERCLA "hazardous substances" shall not be held liable under the CERCLA liabilitiy scheme until after the effective date of the listing of the released substance as a "hazardous material" in accordance with Section 306(a).

MTB Regulations: At the time of the adoption of CERCLA, a large number of CERCLA "hazardous substances" were already subject to the Department's Hazardous Materials Regulations (HMR), as developed and administered by the Department's Materials Transportation Bureau (MTB). Those substances can be divided into three categories. First, substances that meet MTB's hazardous classifications, contained in 49 CFR, Part 173, are fully regulated as hazardous materials. For example, cyanide, while it is a CERCLA "hazardous substance" because it is designated under Section 307 of the CWA, is already fully regulated under the HMR because it meets the hazard class definition for a Class B Poison (49 CFR 173.343).

Second, with regard to CERCLA "hazardous materials" that had been designated under Section 311 of the CWA, those substances that were not already subject to the HMR had been subjected to them by a final rule issued by MTB on May 22, 1980, the purpose of which was to coordinate the administration of the HMTA with EPA's administration of the CWA (45 FR 34560). The effect of that rule was that when such a substance is transported in a package containing a quantity of the substance which equals or exceeds the "reportable quantity" (RQ) for that substance, as determined by EPA, the shipment must conform with certain shipping paper and package marking requirements (49 CFR 173.1300). If a quantity of a hazardous substance equal to or exceeding its RQ is released, the release must be immediately reported (49 CFR 171.17). Thus, for the purpose of the HMR, "hazardous substance" is defined, in effect, as a material designated by EPA under Section 311 of the CWA, but only when it is transported in a package containing at least the RQ of that substance. These "hazardous substances", along with their RQ's, were incorporated into the Hazardous Materials Table at 49 CFR 172.101.

Third, with regard to CERCLA "hazardous substances" that have been designated under Section 3001 of the Solid Waste Disposal Act, commonly known as the Resource Conservation and Recovery Act (RCRA), i.e., "hazardous wastes" MTB issued a final rule, simultaneously with the rule discussed above, to coordinate the administration of the HMTA with EPA's administration of RCRA (45 FR 34560). That rule incorporated EPA's "cradle-to-grave" manifest system and other requirements for the transportation of hazardous wastes into the HMR (49 CFR 171.3) and defined the term, "hazardous waste," to mean, for purposes of the HMR, any material subject to the EPA manifest system (49 CFR 171.8). One effect of this definition is that shipments by shippers qualifying for EPA's small generator exemption (generally those generating less than 1,000 kilograms of hazardous waste per month) of materials not satisfying DOT hazard class definition are not presently subject to the HMR (see 40 CFR 261.5).

The Environmental Protection Agency's staff considers the coordination process developed between EPA and DOT dealing with Clean Water Act, Section 311 (b) (2) (A) hazardous substances to be an appropriate model for incorporating CERCLA, Section 102 (b) substances into the HMR's. This process is briefly described in the following excerpt from a staff paper entitled, Coordination of Regulatory Issues Related to Designation of Hazardous Substances Under CERCLA and HMTA prepared by EPA's Headquarters Technical Assistance Team.

> EPA and DOT engaged in a joint effort to develop regulations that would meet the statutory pollution abatement requirements of the Clean Water Act without duplicating DOT's HMR framework. EPA was responsible for determining the "hazardousness" of substances. This determination resulted in designation of CWA Section 311 hazardous substances and assignment of RQs by EPA in August, 1979. The chief responsibility then shifted to DOT, which was responsible for incorporating the hazardous substances and the associated RQs in the HMRs.
>
> Considerable effort was required to develop rules governing hazardous substances in mixtures and solutions. Under an interagency agreement, DOT's Transportation Systems Center analyzed the effects of various regulatory options for EPA. The final rules regarding mixtures adopted were satisfactory to both DOT and EPA. The Clean Water Act Section 311 substances were added to the

> Hazardous Materials List and became subject to ammended HMRs in May, 1980.
>
> Section 311 hazardous substances already listed as hazardous materials had RQs added to the hazardous materials table alongside the substances' names. Section 311 hazardous substances which were not already on the hazardous materials list were added to the list. When Section 311 hazardous substances possess qualities placing them in an HMR hazard class (e.g., flammable liquid), they are listed in that hazard class and become subject to the regulatory requirements for that class. RQs are also listed alongside these substances' names. When Section 311 hazardous substances do not possess qualities placing them in an HMR hazard class, they are listed in the hazard class "Other Regulated Material-E" (ORM-E) and the RQ is listed alongside these substances' names.

While the coordination process developed around the CWA is generally applicable to CERCLA, it must be recognized that CERCLA applies to hazardous substance releases into all media. Thus, in its November 15, 1983 response to MTB's ANPRM, EPA noted that:

> Following EPA's assignment of RQs to the CWA hazardous substances, DOT expanded the HMR to include 49 CFR Section 171.17, which requires immediate notification of the National Response Center when an RQ of a hazardus substance from one package or transport vehicle is discharged into or upon navigable waters or adjoining shorelines. While this language was written to conform to the requirements of CWA, it is not consistent with the more recent multi-media reporting requirements of CERCLA which apply to releases to air, land, and water. For the HMR to remain consistent with CERCLA, EPA recommends that the language of 49 CFR Section 171.17 be ammended to include releases to all media. Because most transporters are probably more familiar with the HMR than with the CERCLA reporting requirements, the aforementioned change to the DOT regulations will ensure that the reporting requirements of CERCLA are met. We urge DOT/MTB to make this change to conform with the clear intent of CERCLA and to minimize potential confusion in the regulated community. Furthermore, when the RQs for any CWA Section 311 substances are adjusted by EPA, the HMR RQs should be adjusted accordingly.

2.0 DESCRIPTION OF SURVEY RESPONDENTS

In the choice of firms to be interviewed for this study, several considerations came into play. Foremost among them was to gain a reasonably accurate impression of the broad impacts of CERCLA on shippers and carriers. Thus, the survey could not be restricted to firms involved exclusively with newly listed substances, if indeed such firms exist. Rather, the primary selection criterion was to chose firms handling a large number of hazardous shipments, consisting of many different products, either in absolute numbers or in relation to firm size. Also, important in the selection was the need for a broad range of firms sizes and a broad range of functional specializations in order to gain some understanding as to how impacts vary as a function of firm size and how perceptions of CERCLA vary among types of affected persons.

Because budgetary constraints and OMB regulations restricted the survey population to fewer than ten respondents in each group, truly representative samples were not feasible. The resulting shipper group contained one very large oil company, four large chemical companies (each interviewed at a different level of the corporate hierarchy), two product distributors of modest size, and one very small specialty-chemical firm. The carriers included one railroad, one general-freight motor carrier, two liquid-bulk motor carriers (one large, one small), one ocean-freight line, one stevedoring* firm, and the dominant small-package carrier.

Although participation in this study was strictly voluntary, almost all firms solicited agreed to participate. Only 18 initial contacts were necessary to secure the 15 respondents. The three firms which declined did so on the grounds that they handled no newly listed substances and thought it would be pointless to speculate about possible effects of CERCLA. Hence, there was no statistical bias created by the voluntary nature of survey participation.

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*"Stevedoring" refers to the loading and unloading of ships. Firms engaged in this trade ordinarily deal with railroads, motor carriers, and barge lines as well. Because they function at the interface between the domestic and international systems, they must deal with some of the most complex paperwork procedures in transportation. As a result, they often employ as many white-collar workers as actual stevedores.

Capsule descriptions of the shippers and carriers that were interviewed are listed below:

Shippers

1. Bartlett Chemical Company, New Orleans, LA. This firm of 32 employees distributes laboratory and industrial chemicals. Its primary customers are oil-field service companies and municipalities. Its Vice President, who is responsible for all phases of the business, was interviewed.

2. Delta Commodities, Harvey, LA. Operates a liquid-bulk terminal receiving commodities by barge and rail from throughout the United States and transloading them to ships bound chiefly for South America and the Caribbean. Seventy-five employees are required to process approximately 5 million barrels of products per year. Agricultural commodities (e.g. molasses and tallow) make up the largest portion of sales, but lubricants and various petro-chemicals are also handled in substantial lots. Its Safety Manager supplied answers for this survey.

3. Exxon Company, USA, Houston, TX. As a division of the Exxon Corp. (the nation's largest oil company with 1982 revenues of $102 billion), Exxon Company USA, operates all of its parent's domestic oil production, refining, distribution, and marketing facilities. Its refineries handle more than one million barrels of oil per day, which requires movement of a total of about four million barrels per day of crude or products in various stages of the process. A panel of hazardous materials coordinators from production, refining, and marketing together with the division environmental affairs specialist, participated in the interview.

4. Fisher Scientific, Fairlawn, NJ. Now a wholly owned subsidiary of Allied Corp., Fisher Scientific is the nation's leading supplier of laboratory chemicals and equipment. It generates revenues of about $500 million per year and employs about 4000 persons. Most of the answers for the questionnaire were provided by its Manager for Hazardous Materials

Packaging at its Fairlawn, NJ plant, with additional transportation data from its headquarters Director of Transportation.

5. Grace, W.R./Organic Chemical Division, Lexington, MA. Of W.R. Grace's approximately $6 billion annual revenue, its Organic Chemicals Division accounts for more than $100 million per year. It produces a variety of chemicals for agriculture and construction as well as many intermediates. The Division's Traffic Manager and its Director of Environmental Affairs responded to the interview.

6. Monsanto Company, St. Louis, MO. Monsanto Company produces chemicals, plastics, agricultural products, man-made fibers, and specialized electronic and process-control systems at about 150 plants worldwide. It generates about $7 billion in total sales and employs nearly 60,000 persons. The Manager of its Emergency Response Team at its world headquarters in St. Louis answered most of the survey questions, with support from a transportation specialist and an attorney.

7. Union Carbide/Glycol-Ethylene Oxide Division, Taft, LA. The Taft plant produces about 1.5 billion pounds per year of glycol, ethylene oxide, toluene, benzene, xylene, and other petro-chemicals, worth more than $100 million per year. Its owner, Union Carbide, is a leading producer of chemicals, industrial gases, alloys, batteries, etc. with revenues in excess of $9 billion per year. The plant's Marine Activity Specialist and its DOT Coordinator responded to the questionnaire.

8. Union Etchants, Woburn, MA. Union Etchants is a very small business (owner plus two employees) engaged in the preparation and distribution of etching solutions used in the manufacture of integrated circuits and printed circuit boards. It purchases various high-purity reagents from vendors like Fisher Scientific and blends them for specific applications. Its products are sold in quantities ranging from 150 ml bottles to 5 gallon cans. The proprietor was interviewed.

Carriers

1. Boston & Maine Railroad, Billerica, MA. The Boston & Maine Railroad is a medium-sized, railroad serving Massachusetts with lines extending into most contiguous states. It employs about 3100 persons and generated about $122 million in 1981. It was recently merged with the Maine Central and the Delaware and Hudson. The interview was conducted with the railroad's Safety Manager and its Environmental Engineer at their offices in Iron Horse Park in Billerica, MA.

2. DSI Inc., Houston, TX. Among the largest truck lines specializing in hauling liquid-bulk chemicals is DSI, headquartered in Houston. The firm employs 700 persons, owns 285 tractors and 300 trailers, and had revenues of $44 million last year. Its trucks pick up most of their loads at Gulf Coast petro-chemical plants and transport them to users throughout the U.S. and Canada. Its Safety Director responded to the questionnaire.

3. Lykes Brothers Steamship Lines, New Orleans, LA. Recently spun off from LTV Corp., Lykes Brothers Steamship operates 46 U.S.-flag vessels engaged in liner trade between this country and the rest of the world. It employs roughly 900 white-collar workers, up to a thousand longshoremen and more than 2000 crewmen and officers aboard its ships. Most of its approximately 360 sailings per year from U.S. ports are from Long Beach, New Orleans, Mobile or Baltimore. The Traffic Service Manager at its corporate headquarters in New Orleans answered the questionnaire.

4. Roy Brothers Trucking, Billerica, MA. Roy Brothers is a family-owned, liquid-bulk carrier generating about $6 million per year in revenue and employing about 50 persons. It owns 35 tractors and 100 trailers and rents an additional 9 tractors. It also hires the services of independent truckers to handle about half of its business. Its president, who also does some driving and repair work, responded to the interview.

5. St. Johnsbury Trucking, Holliston, MA. St. Johnsbury is among the larger general-freight motor carriers and serves the eastern region of the country through 53 terminals. Its 1981 revenues were $136 million and it employed nearly 3800 persons. About 1000 tractors and 1500 trailers constitute its fleet. The Safety Director at corporate headquarters in Holliston, Massachusetts supplied data for this survey.

6. Strachan Shipping, New Orleans, LA. Strachan Shipping provides stevedoring and marine terminal operations in the port of New Orleans and also serves as agent for eleven firms engaged in liner trade. In this latter function, it performs the same services as a freight-forwarder. Staffing includes nearly 100 white-collar workers and up to 100 longshoremen, depending on workload. Its Safety Director answered most of the questions, with some assistance form the Office Manager and representatives of its Atlantic Cargo Service agency at its New Orleans headquarters.

7. United Parcel Service, Greenwich, CT. With more than 110,000 employees and nearly $6 billion in revenues, UPS so dominates the small package delivery business that it functions as a quasi-regulatory body. It sets its own standards (more stringent than DOT's for some substances) for packaging hazardous materials as detailed in Guide for Shipping Hazardous Materials Via UPS, a copy of which is being supplied to EPA along with this report. Even though hazardous shipments make up only about one-third of one percent of its total volume, they still amount to about 20,000 per day --- far more than any other carrier. The Manager for Hazardous Materials at UPS headquarters in Greenwich, Connecticut was interviewed.

3.0 PRINCIPAL IMPACTS OF CERCLA ON TRANSPORTATION OF HAZARDOUS PRODUCTS

This section discusses and summarizes the replies of the shippers and carriers to questions regarding how CERCLA might affect the routine operation of their businesses and how costs might change. To place these considerations in proper context, the initial questions in the survey were directed toward quantifying the total volume of hazardous materials and of newly listed hazardous substances being handled by each respondent. Cost areas discussed explicitly in the interviews were operating personnel, training, paperwork or data processing, and insurance (see interview forms in Appendices A and B). Respondents were also encouraged to suggest any other areas in which CERCLA might impose higher costs. In the following discussions (3.1 through 3.6), all of these issues are presented, roughly in the order in which they appear on the interview forms.

3.1 VOLUME OF SHIPMENTS AFFECTED

The total volume of hazardous materials ranged from about 500 to more than 6 million shipments per year across the survey group. Most respondents reported no known movements of newly listed substances as products. A few suspected there might be some internal uses of such substances (e.g., in quality-control test procedures). Among the few firms having definite involvement with the transportation of products containing newly listed substances, the volume of such traffic was thought to be very small, probably less than 0.1 percent of the volume of hazardous materials.

While reviewing the table of newly listed substances, some of the carrier personnel remarked that it would be quite difficult to make any quantitative statements about traffic volume in these substances because few, if any, of them appeared to have STCC codes. Seven-digit STCC (Standard Transportation Commodity Classification) Codes are assigned by the Census Bureau to specific commoditites to facilitate the collection and compilation of statistics. About 1400 chemicals have specific 7-digit codes in the "28" series. These are listed in various Census publications and also in tariffs. (See Standard Transportation

Commodity Code Tariff STCC 6001-H, Chemicals or Allied Products, pp. 461-481 and Hazardous Materials, pp. 653-681, issued November 1, 1979, effective January 1, 1980.)*

In the STCC system, chemicals are grouped by type (e.g., "organic acids or salts") but not listed in any particular order within groups. Chemicals which do not move in sufficient volume to justify individual 7-digit codes are lumped together under the 5-digit NEC (not elsewhere classified) codes. Figure 3-1 shows one page from the STCC 6001-H, effective January 1, 1980.

A great many chemicals have a duplicate listing in the 49 series codes which are reserved for hazardous materials. By definition, none of the newly listed substances appear in the 49 series. STCC 6001-H lists more than 3000 of the 49 series commodities in the 1980 classification.*

The following table summarizes the survey respondents' replies regarding the volumes of hazardous shipments handled by their respective firms or plants:

Shippers

1. Barlett Chemical Co.

   9000 hazardous materials shipments per year of which about half (20 per day) leave by company trucks and half leave by common carrier (UPS or general motor freight). No newly listed substances handled.

2. Delta Commodities

   18,000 shipments per year amounting to about 5 million barrels. Inbound shipments by rail and barge. Outbound movements by ship. Most commodities handled are non-hazardous, e.g., molassess, tallow, lubricants. Some are HMR-regulated, but no newly listed substances handled.

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*Also available through the U.S. Department of Transportation, Transportation Systems Center (TSC), Office of Research and Analysis, Operator/Vehicle Division, Cambridge, MA 02142.

TARIFF STCC 6001—H—SECTION 2

28 CHEMICALS OR ALLIED PRODUCTS

STCC	Description
28 141 82	Petroleum propylene trimer
28 15	CYCLIC INTERMEDIATES OR DYES OR ORGANIC PIGMENTS (LAKES OR TONERS)
28 151	Cyclic intermediates from benzene, toluene,naphthalene,anthracene, pyridine,carbazole or other cyclic chemical products
28 151 08	Amyl phenol
28 151 10	Acetanilide (antifebrin or n-phenyl-acetamide)
28 151 11	Carbolic acid (phenol)
28 151 12	Aniline (aminobenzene,aniline oil or phenylamine)
28 151 13	Alpha naphthol
28 151 14	Alpha-naphthylamine (x cake)
28 151 15	Anthracene,ot crude (anthracin or green oil,ot crude)
28 151 16	Benzene hexachloride
28 151 17	Beta naphthol
28 151 19	Chlorobenzene (chlorobenzol) or monochlorobenzene (monochlorobenzol)
28 151 21	Cresylic acid,including meta,ortho or para (cresol)
28 151 22	Cumene
28 151 23	Bis phenol-a (bisphenolisopropylidene, isopropylidenebisphenol or para,para-isopropylidenediphenol)
28 151 25	Dinitromethylaniline solution
28 151 26	Dinitrochlorobenzene (dinitrochlorobenzol)
28 151 27	Methylene diphenyl diisocyanate
28 151 28	Dinitrobenzene (dinitrobenzol)
28 151 29	Dinitrophenol
28 151 30	Isophthalic acid (meta-phthalic acid)
28 151 31	Dinitrotoluene (dinitrotoluol),dry
28 151 32	Dinitrotoluene (dinitrotoluol),ot dry
28 151 33	Biphenyl (diphenyl)
28 151 34	Dimethyl terephthalate (dmt)
28 151 35	Phthalic anhydride (acid phthalic anhydride)
28 151 36	Dodecyl benzene,pentadecyl benzene & tridecyl benzene
28 151 37	Mononitrotoluene (mononitrotoluol),nec, dry
28 151 38	Mononitrotoluene (mononitrotoluol),nec, ot dry
28 151 39	Naphthalene,ot crude (naphthalin or tar camphor,ot crude)
28 151 40	Methyltaurine solution,containing not more than 70 percent methyltaurine
28 151 41	Maleic acid or maleic anhydride
28 151 42	Benzyl chloride
28 151 43	Benzoyl chloride
28 151 44	Dichlorophenol
28 151 45	Nitroxylene (nitroxylol)
28 151 46	Paranitrophenol
28 151 47	Nitrobenzene (nitrobenzol) (oil mirbane)
28 151 50	Xylidine (aminodimethylbenzene,aminoxylene or dimethylaniline)
28 151 51	Isocyanate
28 151 52	Orthodichlorobenzene (orthodichlorobenzol) or orthodichlorobenzene (orthodichlorobenzol) emulsified
28 151 53	Orthonitrotoluene (orthonitrotoluol)
28 151 54	Petroleum alkylate detergent intermediate
28 151 57	Paradichlorobenzene (paradichlorobenzol)
28 151 58	Polyethylbenzene or diethylbenzene or ethylbenzene
28 151 59	Pyridine
28 151 60	Benzoic acid
28 151 61	Acid,paratertiary butyl benzoic,dry
28 151 62	Para-hydroxydiphenyl (para-phenylphenol or-para-xenol)
28 151 65	Butyl phenol
28 151 66	Toluene diisocyanate
28 151 67	Toluidine (aminotoluene)
28 151 68	Trichlorobenzene (trichlorobenzol)
28 151 70	Picolini,crude
28 151 71	Furan
28 151 73	Dichloroaniline
28 151 74	Tetrahydrofuran
28 151 75	Tetrahydrophthalic anhydride or hexahydrophthalic anhydride
28 151 77	Paraxylene
28 151 79	Cyclohexanone
28 151 80	Cyclohexylamine
28 151 81	Ethylcyclohexylamine
28 151 82	Melamine
28 151 86	Para-nitrochlorobenzene
28 151 88	Linear alkyl sulfonates
28 151 90	Dye intermediates,nec
28 154	Organic dyes
28 154 10	Dyes or colors,coal tar,other than indigo,dry
28 154 12	Dyes or colors,coal tar,other than indigo,liquid or paste
28 154 15	Indigo,dry
28 154 20	Indigo,liquid or paste
28 154 25	Cochineal
28 154 30	Dye soap
28 154 50	Wall paper pulp coloring,nec
28 154 60	Resorcinol
28 154 91	Dye stuffs,nec
28 154 92	Mordants,nec
28 158	Organic pigments (lakes or toners)
28 158 93	Color,mortar,nec,dry
28 158 94	Color,mortar,nec,paste or pulp
28 16	INORGANIC PIGMENTS exc.blacks see 2899 or organic color pigments see 2815
28 161	Titanium pigments
28 161 20	Titanium pigments or composite,dry
28 161 25	Titanium dioxide,nec
28 161 30	Titanium dioxide and water mixed,consisting of not exceeding 78 percent by weight of titanium dioxide
28 161 35	Titanium dioxide,ultra fine powder
28 162	Lead pigments
28 162 10	Lead oleate
28 162 15	Litharge or white lead,wet with water
28 162 17	Litharge,dry
28 162 25	Lead,red,sublimed or white,dry
28 162 30	Compounds,lead or zinc,dry
28 162 35	Compounds,lead or zinc,paste or ground in oil
28 162 45	Lead,red,sublimed or white,paste or ground in oil

FIGURE 3-1. EXAMPLES OF STCC CODES

3. Exxon USA

Approximately 1.1 million barrels per day thruput, requiring 4 million barrels per day total transportation. Virtually all shipments hazardous. No product shipments affected by CERCLA, but there may be some internal uses for newly listed substances; quantity unknown, but small.

4. Fisher Scientific

30 million pounds of chemicals are moved from Fisher's two plants to its 35 distribution centers each year, which requires about 2000 truck shipments. From these centers, about 1.5 million shipments (average weight of 20 pounds) move to customers mostly by UPS. Nearly all of these shipments are affected by HMR but only a few thousand at most (less than 0.2 percent) are newly listed substances.

5. W.R. Grace & Co./Organic Chemicals Division

100 rail carloads per year, 650 by general motor freight; 100 dry-bulk motor freight; 50 by air and 100 by UPS. All the foregoing subject to HMR. No products among the newly listed substances.

6. Monsanto

Produces about 15 billion pounds of products per year which are delivered to customers in tens of thousands of shipments ranging from UPS to shiploads. Details are not kept at corporate headquarters. Very few product shipments involve newly listed substances.

7. Union Carbide/Glycol - Ethylene Oxide Div/Taft Plant

Approximately 1.5 billion pounds per year, all hazardous, shipped as follows:

600 railcar loads

2400 truck loads

250 barge loads (1.2 billion pounds)
50,000 drums
4600 samples

Only a few shipments per year fall under the newly listed category and even those were already regulated by certain international authorities.

8. Union Etchants

About 500 total shipments per year, distributed as follows:

Approximately 200 by private truck,

Approximately 300 small package shipments by motor carrier,

Approximately 10 by air,

All hazardous but none newly listed.

Carriers

1. Boston and Maine Railroad

Handles about 15,000 full carloads of hazardous commodities plus another 9000 loads which contain some packages of hazardous materials. Appendix E gives complete details of the B & M's hazardous traffic mix. None of the newly listed substances was thought to be carried by the B & M.

2. DSI

80,000 truckloads per year, all liquid-bulk chemicals, nearly all hazardous. Only about 50 loads per year (less than 0.1 percent) of are of newly listed substances; mainly fluroacetic acid and, various benzenamines, various chlorophenols, and heptachlorobenzene.

3. Lykes Bros. Steamship

Handles about 100,000 tons of hazardous cargo per year dispersed among about 360 sailings from U.S. ports. Most of this cargo consists of drums or containers. Some of the dry solids are handled in bags on pallets. Solvents, lubricants, military fuels, insecticides, herbicides, ammunition, and dynamite are the most frequently loaded materials. None of the newly listed substances was recognized by Lykes staff members.

4. Roy Bros. Trucking

Nearly 10,000 truck loads per year, all liquid bulk chemicals. No newly listed substances recognized by Leo Roy, president.

5. St. Johnsbury Trucking

About 30,000 shipments of hazardous materials per year, mostly packages, some drums up to 55 gallons. Cannot identify any newly listed substances. Some are probably carried but the number is very small.

6. Strachan Shipping

Loads 100 to 200 vessels per year including about 1200 hazardous shipments. Insecticides, solvents, tetraethyl lead, and fumigants are most frequently handled materials. Staff did not recognize any of the new substances on the CERCLA list and felt that few, if any, had ever been handled by Strachan.

7. United Parcel Service

About 20,000 hazardous shipments per day (out of six million total per day). All shipments are packaged, weighing less than 50 pounds (70 pounds under new regulations for UPS). Number of newly listed substances handled is unknown but thought to be very small. Of the list of chemicals affected by CERCLA, 198 are accepted for shipment by UPS, provided that UPS specification packaging is used. Ninety-four are not accepted by UPS and never have been. An additional 87 are accepted but have RQs of 100 pounds or more so that the packages handled by UPS would not be subject to CERCLA. The remaining CERCLA-listed chemicals will continue to be carried by UPS in DOT-specification packaging.

3.2 SPECIAL STAFF FOR HAZARDOUS SHIPMENTS

Relatively few firms have any employees who are concerned with the transportation of hazardous goods exclusively. In the vast majority of large firms, the official(s) responsible for such matters also attend(s) to employee safety or environmental regulatory compliance, or management of emergency response team(s) or product packaging or transportation scheduling or some combination of the foregoing. Among small firms, the proprietor or some other official with broad responsibilities must also worry about hazardous material shipments. Of the 15 survey respondents, only one (UPS) had a full-time hazardous materials transportation staff specialist at headquarters. Fisher Scientific's three-person staff for hazardous materials packaging came close to fitting the description of a full-time dedicated group. However, transportation coordinators who devote a substantial fraction of their time to HMR compliance issues are found at nearly every plant among the large chemical and petroleum companies. In no case was there special staffing for hazardous substances exclusively, nor could any respondent imagine that there could possibly be enough work to justify such a position in any firm in the country.

Almost all of the day-to-day work of complying with Federal regulations is carried out by operating personnel incidental to their other duties rather than by dedicated staff. Hence, it is often difficult to estimate precisely how much labor is required for compliance. For high-volume bulk movements in containers dedicated to (and thus permanently labelled for) a particular product, the incremental labor costs are too small to be readily accountable. When goods are packaged, however, labor requirements increase substantially, but are still quite small (see section 3.4 for further discussion on this matter). It is only when "odd" shipments must be handled that staff specialists are required to spend substantial time. "Odd" or one-of-a-kind shipments are made by organizations of all types and sizes. For some large chemical manufacturers, such shipments may number in the thousands each year. The reasons for the existence of these movements are numerous and varied. A substantial portion of them fall into the urgent category, i.e., shipments which must be moved faster than normal. In such cases, shipments usually routed by surface carriers must be flown, or movements handled by relatively slow modes (barge, rail) must be diverted to trucks. Other common instances of "odd" cargos include experimental products and packagings, samples, and returned goods. Occasionally situations arise in which "odd" shipments must be prepared by persons who are not at all familiar with hazardous materials transportation regulations, for example, a salesman or field engineer returning a sample of a customer-developed product to his home laboratory for analysis.

Staffing for hazardous goods transportation also depends on the mode(s) being used. Air shipments require special packaging for many substances. Ocean freight shipments usually present the most complications. Large quantities, long transit times, high humidity, possible violent storms and possible dangerous reactions between different commodities make the planning for ocean shipments of hazardous materials a much more difficult task than for any other mode. Compliance with the laws and regulations of different nations plus several international agencies generates much extra paperwork.* Thus, an ocean movement may require hours or even days of effort by hazardous materials specialists, whereas most domestic moves require little or no such labors.

3.3 TRAINING

Every survey respondent conducts safety training for employees in one form or another. Most commonly, new employees who will handle hazardous materials are given a few days' classroom training supplemented by working under close supervision for a week or so. Monthly or bi-monthly safety seminars of one or two hours' duration are also common. Annual refreshers of one to three days' duration are widely used by firms dealing with more hazardous products.

Training of operating personnel is most commonly conducted by corporate staff members, although about a quarter of the respondents hired outsiders for this purpose. Nearly all firms prepare some of their safety training materials, but virtually all of them also purchase some materials, especially slides, movies, videotapes, etc. Appendix E contains a brief example of the kind of detailed site-specific and equipment-specific information which must be developed by each firm. For a large chemical company, the in-house transportation safety manuals may amount to many thousands of pages.

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*See L.W. Bierlein, Red Book on Transportation of Hazardous Materials, Chapter 11 and Chapter 25 for description and discussion of the numerous organizations involved in international hazardous shipments.

While operating personnel receive their training in-house for the most part, corporate staff and executives derive theirs at outside meetings. Seminars of one day to one week are conducted by trade associations, government agencies, and many varieties of for-profit entities. Some of the latter are firms whose sole business is to conduct training sessions while others include management consultants, publishers, and manfacturers of safety equipment. Most corporate safety staff members attend one to three such outside seminars per year.

Among very large firms, e.g., Exxon, the training process is more complex owning to the large number of layers in the organization chart (i.e., greater than 10). In such firms, training for compliance with new regulations must generally be passed through several layers of the organization - a process which usually requires several months.

At the opposite end of the firm-size spectrum, training may also be delayed simply because the principals in such small firms are sometimes unaware of new regulations until enforcement begins. Although the survey population included only one very small business and only two others with revenues of less than $10 million per year, it seems fairly safe to generalize that the majority of small firms cannot justify full-time specialists for safety or environmental affairs. Instead, these concerns are handled by individuals with many other responsibilities, often the proprietor. While such persons have some awareness of new environmental laws through the general news media and through occasional articles in trade journals, they do not read specialized journals concerning regulations. Nor do they attend training sessions more than once every year or two, if at all. As a result, they often learn of new regulations through trial and error. For small shippers, this means that cargos are refused by carriers. Small trucking firms learn from state troopers, weighing-station clerks, and other enforcement personnel, often as the result of the imposition of a fine. This process is clearly much slower and much more likely to arouse antipathy toward the regulations. The vast majority of these fines are levied by state and local courts based upon citations issued by state and local police. Almost all of them involve truck shipments. Various administrations within DOT also initiate enforcement actions, more than a thousand per year. Table 3-1 summarizes these actions for 1980-1981. Table 3-2 lists examples of the types of violations discovered by various DOT agencies and the resulting penalties imposed.

The cost of training personnel to handle hazardous shipments to comply with Federal regulations proved difficult to quantify. In the first place, most of it is combined with training concerned with in-plant handling procedures and with avoiding injury to personnel as opposed to protecting the environment. Secondly, much of it would occur even if no Federal regulations existed.

When queried as to costs, most respondents spoke first of the out-of-pocket costs for outside seminars and purchased training materials. These seminars cost less than a thousand dollars per year for small firms and no more than ten thousand dollars per year for the interviewed officials of the largest firms. In the latter case, however, it is reasonable to assume that many other employees throughout the company are also attending such seminars, but they are not charged to the travel budgets of the corporate safety staff and are thus difficult to total. Purchased materials amount to only a few thousand dollars per year at most firms.

Upon further reflection, it became obvious that at every firm, the cost of employee time to receive training was the most expensive item. This cost ranged from about four hours to three days per year for every employee handling hazardous materials or about 0.2 percent to 0.8 percent of total wages of affected workers. Wage costs generally amounted to slightly more than half of the total cost of transportation activities. Thus, one may conclude that safety training generally accounts for about 0.1 percent to 0.4 percent of the total cost of transportation. Firms handling relatively low-hazard shipments (e.g., UPS) were at the low end of this range while those with a high-proportion of dangerous goods (e.g., DSI) were at the high end of the cost range.

TABLE 3-1. HAZARDOUS MATERIALS ENFORCEMENT ACTIONS - 1980-1981

OPERATING ADMINISTRATION	ACTION	1980	1981
USCG[1]	CIVIL PENALTY ACTIONS INITIATED	935	N/A
	CIVIL PENALTY ACTIONS COMPLETED	996	N/A
	TOTAL COLLECTED	$167,136	N/A
	AVERAGE PENALTY	$ 168	N/A
FAA	CRIMINAL CASES INITIATED	3	2
	CRIMINAL CASES COMPLETED	1	1
	TOTAL FINES	$ 25,000	$ 25,000
	CIVIL PENALTY ACTIONS INITIATED	99	170
	CIVIL PENALTY ACTIONS COMPLETED	13	97
	TOTAL COLLECTED	$ 30,500	$182,000
	AVERAGE PENALTY	$ 2,446	$ 1,876
FHWA	CIVIL PENALTY ACTIONS INITIATED	126	209
	CIVIL PENALTY ACTIONS COMPLETED	140	N/A
	TOTAL COLLECTED	$411,183	$453,950
	AVERAGE PENALTY	$ 2,937	N/A
	CASES CLOSED WITH NO ACTION	20	N/A
FRA	CIVIL PENALTY ACTIONS INITIATED	209	70
	CIVIL PENALTY ACTIONS COMPLETED	133	53
	TOTAL COLLECTED	$986,770	$314,850
	AVERAGE PENALTY	$ 7,419	$ 5,941
MTB	CIVIL PENALTY ACTIONS INITIATED	29	12
	CIVIL PENALTY ACTIONS COMPLETED	24	16
	TOTAL COLLECTED	$ 58,950	$ 32,600
	AVERAGE PENALTY	$ 2,456	$ 2,038
	WARNINGS	240	112

[1] A SUMMARY OF CIVIL PENALTY ACTIONS TAKEN BY USCG IN 1981 IS NOT AVAILABLE AS DISTRICT COMMANDERS ARE NO LONGER REQUIRED TO FORWARD THIS INFORMATION TO HEADQUARTERS.

TABLE 3-2. EXAMPLES OF DOT PENALTY ACTIONS CONCERNING THE HAZARDOUS MATERIALS REGULATIONS

COMPANY	OFFENSE	INITIATING AGENCY/PENALTY
Ace Fireworks Co. Inc. Bellevue, Wash. (Private carrier)	Transporting fireworks using a driver without a medical examination [§§177.804 and 391.45(a)]; failing to maintain individual driver qualification files [§§177.804 and 391.51(a)]; failing to require a driver to maintain a daily log [§§177.804 and 395.8(a)]; failing to return Form MCS-63 within 15 days [§§177.804 and 396.9(d)(3)]; and failing to properly mark a vehicle transporting hazardous materials [§§177.804 and 397.21].	$ 7,000.00 (FHWA)
John S. Alexander Fayetteville, NC (Shipper)	Knowingly offered fireworks to Delta Airlines for transportation by air when the package was not properly classed, described, packaged, marked, labeled nor in condition for shipment [§171.2(a)]; failing to properly describe the hazardous material on the shipping papers [§§172.200(a) and 172.202]; failing to mark the package with the proper shipping name [§172.300]; and failing to properly label a package containing hazardous materials [§172.400(a)].	$ 200.00 (FAA)
American Compressed Gases, Inc. Old Tappan, NJ (Private carrier)	Failing to retest and reinspect cylinders which carry hazardous materials within a prescribed period and/or failing to mark said cylinders with these data;and failing to maintain the required markings on a cylinder in legible condition [§§173.1(b) and 173.34].	$ 5,500.00 (FHWA)
Berg Chemical Company, Inc. Bronx, NY (Private carrier)	Carrying hazardous materials using a driver not medically examined each 24 months [§§177.804 and 391.45]; operating a vehicle carrying hazardous materials not marked with the name and address of the carrier [§§177.804 and 397.21]; and operating a vehicle carrying hazardous materials not properly placarded [§177.823].	$ 3,000.00 (FHWA)
Cool Transports, Inc. (Carrier)	Requiring/permitting a driver used to transport hazardous materials to remain on duty more than 70 hours in 8 consecutive days [§§177.804 and 395.3(b)]. 5 counts.	$ 3,750.00 (FHWA)
Design and Production, Inc. and employee Gustaw Przybylo Alexandria, VA (Shipper)	Knowingly checked aboard a passenger carrying aircraft a tool box containing several hazardous materials (including a hazardous material forbidden on passenger-carrying aircraft. This tool box was not properly classed, described, packaged, marked, labeled and in condition for shipment [§171.2(a)]; failing to have properly prepared shipping papers [§§172.200(a) and 172.202]; without required shippers certification [§172.204]; not marked with the proper shipping name [§172.300]; not marked "THIS SIDE UP" or "THIS END UP" [§172.312(a)(2)]; not properly labeled [§172.400(a)]; not marked CARGO ONLY AIRCRAFT [§172.402(b)]; failing to instruct employees of the applicable hazardous materials regulations [§173.1(b)]; packaged in improper packaging [§173.6(b)(1) and 173.24(a)(1)]; and offering a hazardous material for air transportation which exceeded the quantity limitations [§173.27(a)].	$ 2,500.00 (FAA)
Eli Lilly and Co. (Shipper)	Offering a tank car containing hazardous material for rail transportation without first determining that the safety apurtenances and fittings were in proper condition and without tightly securing the fill hole cover against leakage [§§173.31(b)(1) and (3)].	$ 1,500.00 (FRA)
Farwest Sports, Inc. (Carrier)	Requiring/permitting drivers used to transport hazardous materials to make false entries upon their daily log [§§177.804 and 395.8]; and failing to have shipping paper describing shipment of hazardous materials readily available as required [§177.817(e)].	$ 3,000.00 (FHWA)
Geosource Exploration Services (Carrier)	Permitting a driver who was not at least 21 years of age to drive a motor carrier containing hazardous materials [§§177.804 and 391.11(b)(1)]; and failing to furnish the driver a copy of appropriate rules and procedures to follow in the event of delay, accident or emergency [§§177.804 and 397.19(a)].	$ 2,000.00 (FHWA)

TABLE 3-2. EXAMPLES OF DOT PENALTY ACTIONS CONCERNING THE HAZARDOUS MATERIALS REGULATIONS (Cont.)

5.

COMPANY	OFFENSE	INITIATING AGENCY/PENALTY
Hamilton & Sons, Inc. (Carrier)	Failing to maintain the cargo tank certificate or manufacturer's data report in the carrier's file as required [177.814]; and transporting a shipment of hazardous materials not accompanied by a properly prepared shipping paper [§177.817].	$ 3,102.86 (includes interest + court costs)
Ozella Harrington Benson, Arizona (Contract carrier)	Requiring/permitting 5 drivers used to transport hazardous materials to make false entries in their daily logs [§§177.804 and 395.8]. NOTE: Each of the five (5) drivers paid $200.00 of the assessed fine and the Consent Order agreed to cease and desist the previous practices.	$ 9,000.00 + Consent Order (FHWA)
Jesus Jacques Hernandez (Truck driver for S&H Truck Lines) Fontana, CA (Carrier)	Failing to attend a motor vehicle containing Class A or Class B explosives [§§177.804 and 397.5].	$ 125.00 (FHWA)
Holyoke Cooperative Association (Carrier)	Failing to properly maintain a driver qualification file for a driver used to transport hazardous material [§§177.804 and 391.51]; and failing to require the driver to prepare a vehicle inspection report for a vehicle used to transport hazardous materials [§§177.804 and 396.11].	$ 1,000.00 (FHWA)
Philip A. Hunt Chemical Corporation (Shipper)	Offering a shipment of corrosive liquid that was not properly packaged in a DOT specification package [§§171.2(a) and 173.245]; and failing to mark the outside of a package "THIS SIDE UP" or "THIS END UP" to indicate the upward position of the inside packaging [§172.312].	$ 1,000.00 (MTB)
Illinois Central Gulf Railroad (Carrier)	Transporting a tank car containing hazardous material without operable airbrakes [§§174.8(a) and 174.9(a)].	$ 2,000.00 (FRA)
Imperial Trucking, Inc. Honolulu, Hawaii (Common carrier)	Failing to properly placard a motor vehicle transporting hazardous material [§177.823]; and transporting hazardous material without a properly prepared shipping paper [§177.817].	$ 3,000.00 (FHWA)
Larson Tool and Stamping Company (Container Manufacturer)	Manufacturing, marking and selling DOT specification cylinders that were improperly marked and tested. [§§171.2(c), 178.0-2, 178.50-14, 178.50-16, and 178.50-19(a)].	$ 2,000.00 (MTB)
Merrill Transport of Vermont, Inc. South Burlington, VT (Common carrier)	Requiring/permitting a driver of hazardous material to remain on duty more than 60 hours in 7 consecutive days [§§177.804 and 395.3(b)].	$14,000.00 (FHWA)
Missouri Pacific Co. (Carrier)	Transporting hazardous material entrained next to the engine. (§174.91)	$ 4,000.00 (FRA)
Pacific Intermountain Express (PIE) Walnut Creek, CA (Common carrier)	Transporting a poison in a vehicle with vitamins intended for human consumption [§177.841(e)]; failing to require drivers of hazardous material to forward their daily logs [§177.804]; and failing to maintain a cargo tank certificate or manufacturer's data at its principal office [§177.814(a)(3)].	$11,500.00 (FHWA)
Pennwalt Corporation (Shipper)	Offering a tank car containing hazardous material for rail transportation without the safety relief valve being retested. [§173.31(c)(1)].	$ 1,000.00 (FRA)

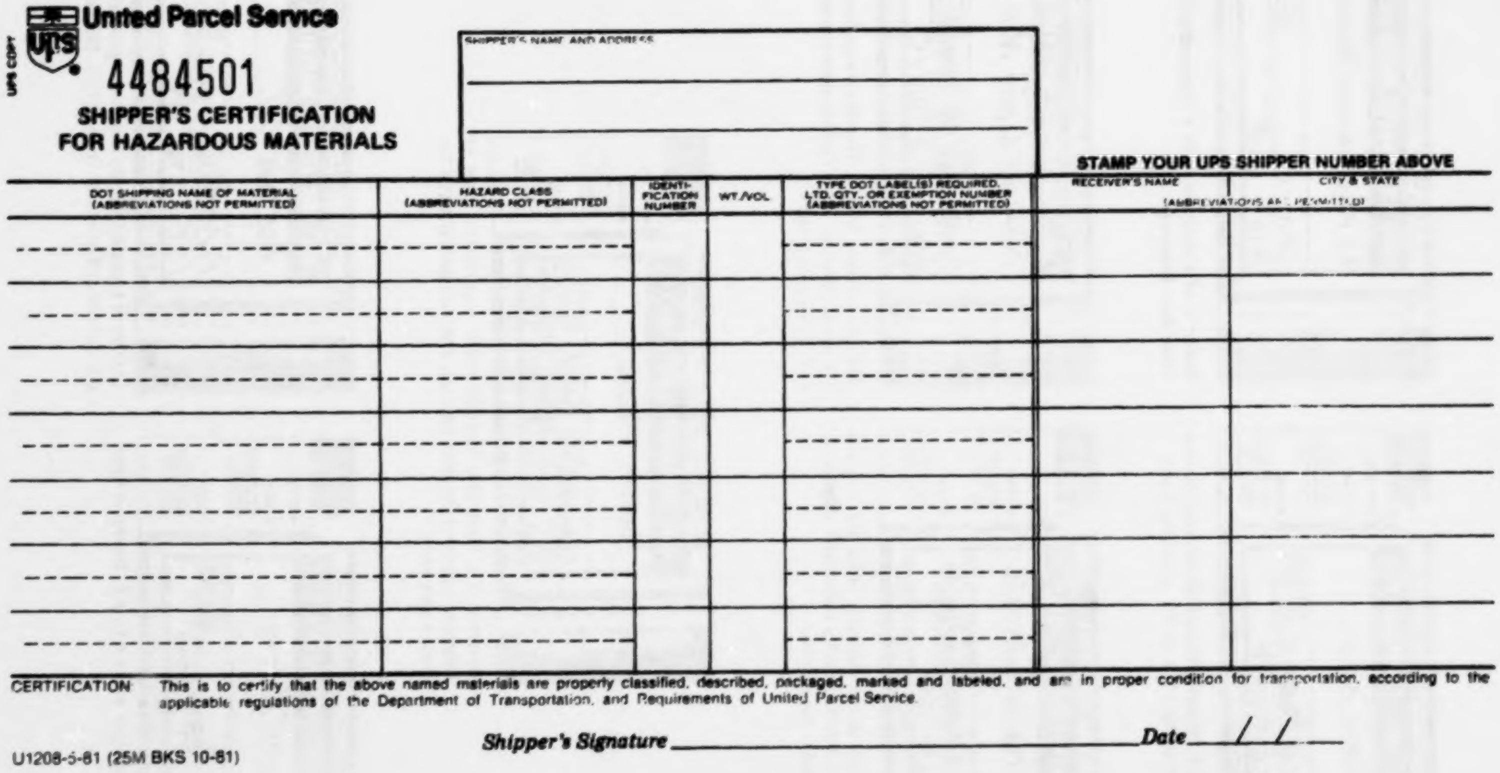
However, it should also be recognized that among the general-goods carriers (e.g., UPS) hazardous goods make up a very small portion of total traffic. Thus the cost of training as a percentage of revenues associated with hazardous shipments is actually much higher for the general goods carriers than for those specialized in hazardous materials. The average of four hours' training for each employee in handling hazardous goods, which UPS provides to 80,000 of its employees each year, costs about $5.8 million, while UPS revenues associated with hazardous goods amount to only about $20 million per year. Hence the cost of training is about 29 percent of total revenue from hazardous traffic.

3.4 PAPERWORK BURDENS

Federal hazardous-materials-transportation regulations impose certain paper-work requirements on shippers and carriers. These include for each shipment: (1) preparation of the "Shipper's Certification for Hazardous Materials" (see Figure 3-2); (2) preparation of shipping paper showing exact shipping name and quantity (see Figure 3-3); and (3) attachment of appropriate Hazardous Materials warning labels (see Figure 3-4). "RQs" must appear on both (1) and (2) when reportable quantities are present. In addition, when releases occur, Hazardous Materials Incident Reports (DOT Form F 5800.1) must be submitted within 15 days of the incident (see Figure 3-5). Shippers make out the routine paperwork accompanying each shipment, but carriers almost always have their drivers and clerks examine it, since the carrier is legally responsible, i.e., subject to fines typically ranging from $100 to a few thousand dollars for any paperwork errors discovered by enforcement personnel. Release reports and notification to the National Response Center (NRC) are also carrier responsibilities; but they are infrequent occurences, and account for only a small portion of the total paperwork burden.

The incremental cost per shipment of routine paperwork ranges over at least three orders of magnitude. For larger firms shipping standard products, the procedures for generating the required documentation are usually computerized.

All of the required information is extracted from the order entry process so that no additional human effort is required to produce the shipping papers.



UPS COPY

United Parcel Service

4484501

SHIPPER'S CERTIFICATION
FOR HAZARDOUS MATERIALS

SHIPPER'S NAME AND ADDRESS

STAMP YOUR UPS SHIPPER NUMBER ABOVE

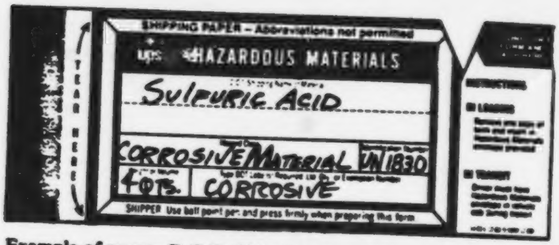
DOT SHIPPING NAME OF MATERIAL (ABBREVIATIONS NOT PERMITTED)	HAZARD CLASS (ABBREVIATIONS NOT PERMITTED)	IDENTIFICATION NUMBER	WT./VOL	TYPE DOT LABEL(S) REQUIRED, LTD. QTY., OR EXEMPTION NUMBER (ABBREVIATIONS NOT PERMITTED)	RECEIVER'S NAME (ABBREVIATIONS ARE PERMITTED)	CITY & STATE (ABBREVIATIONS ARE PERMITTED)

CERTIFICATION This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation, and Requirements of United Parcel Service.

Shipper's Signature ________________ ***Date*** __/__/__

U1208-5-81 (25M BKS 10-81)

FIGURE 3-2. SHIPPER'S DECLARATION FORM



SHIPPING PAPER – Abbreviations not permitted

ups HAZARDOUS MATERIALS

SULFURIC ACID

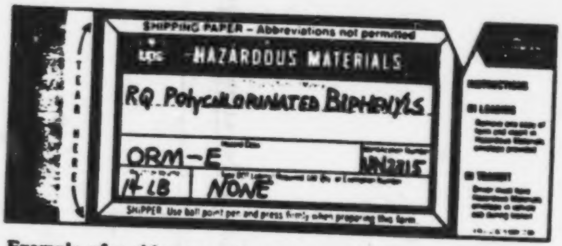
CORROSIVE MATERIAL UN1830

4 QTS. CORROSIVE

SHIPPER Use ball point pen and press firmly when preparing this form

TEAR HERE
INSTRUCTIONS

Example of proper D.O.T. Shipping Named Hazardous Material shipment in a quantity that requires a D.O.T. Diamond Label.



SHIPPING PAPER – Abbreviations not permitted

ups HAZARDOUS MATERIALS

RQ Polychlorinated Biphenyls

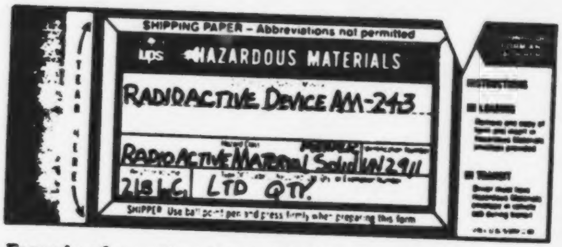
ORM–E UN2315

14 LB NONE

SHIPPER Use ball point pen and press firmly when preparing this form

TEAR HERE
INSTRUCTIONS

Example of a shipment with a Reportable Quantity (RQ) of a Hazardous Substance.



SHIPPING PAPER – Abbreviations not permitted

ups HAZARDOUS MATERIALS

RADIOACTIVE DEVICE AM-243

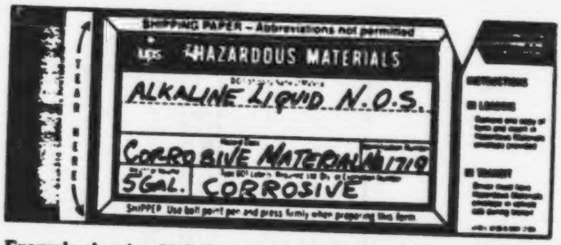
RADIOACTIVE MATERIAL Solid UN2911

218 µC. LTD QTY.

SHIPPER Use ball point pen and press firmly when preparing this form

TEAR HERE
INSTRUCTIONS

Example of a radioactive device shipment, with the required special information for Limited Quantity radioactive shipments. A D.O.T. Diamond Label is *not required.*



SHIPPING PAPER – Abbreviations not permitted

ups HAZARDOUS MATERIALS

ALKALINE LIQUID N.O.S.

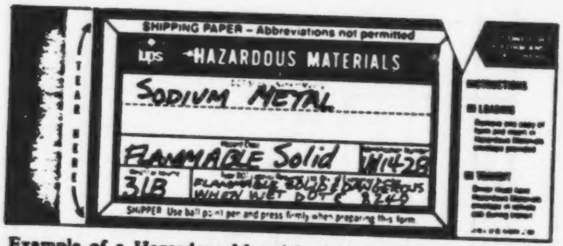
CORROSIVE MATERIAL UN1719

5GAL. CORROSIVE

SHIPPER Use ball point pen and press firmly when preparing this form

TEAR HERE
INSTRUCTIONS

Example showing N.O.S. (Not Otherwise Specified) entry when the actual chemical name *(Triethylenetetramine)* is not a proper D.O.T. Shipping Name.



SHIPPING PAPER – Abbreviations not permitted

ups HAZARDOUS MATERIALS

SODIUM METAL

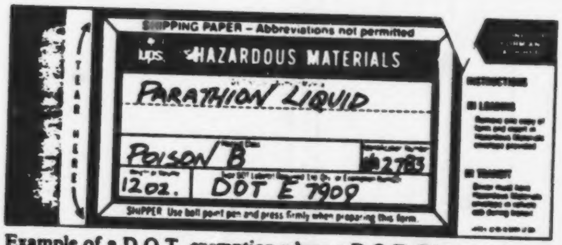
FLAMMABLE Solid UN1428

3LB FLAMMABLE SOLID / DANGEROUS WHEN WET DOT E 8249

SHIPPER Use ball point pen and press firmly when preparing this form

TEAR HERE
INSTRUCTIONS

Example of a Hazardous Material which requires two types of Diamond Labels on the same package, and both label types on the same 5 part form.



SHIPPING PAPER – Abbreviations not permitted

ups HAZARDOUS MATERIALS

PARATHION LIQUID

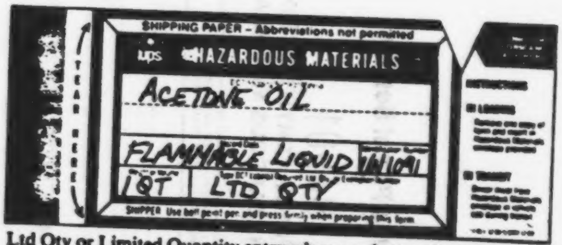
POISON B #2783

12 OZ. DOT E 7909

SHIPPER Use ball point pen and press firmly when preparing this form

TEAR HERE
INSTRUCTIONS

Example of a D.O.T. exemption where a D.O.T. Diamond Label is *not required.*



SHIPPING PAPER – Abbreviations not permitted

ups HAZARDOUS MATERIALS

ACETONE OIL

FLAMMABLE LIQUID UN1091

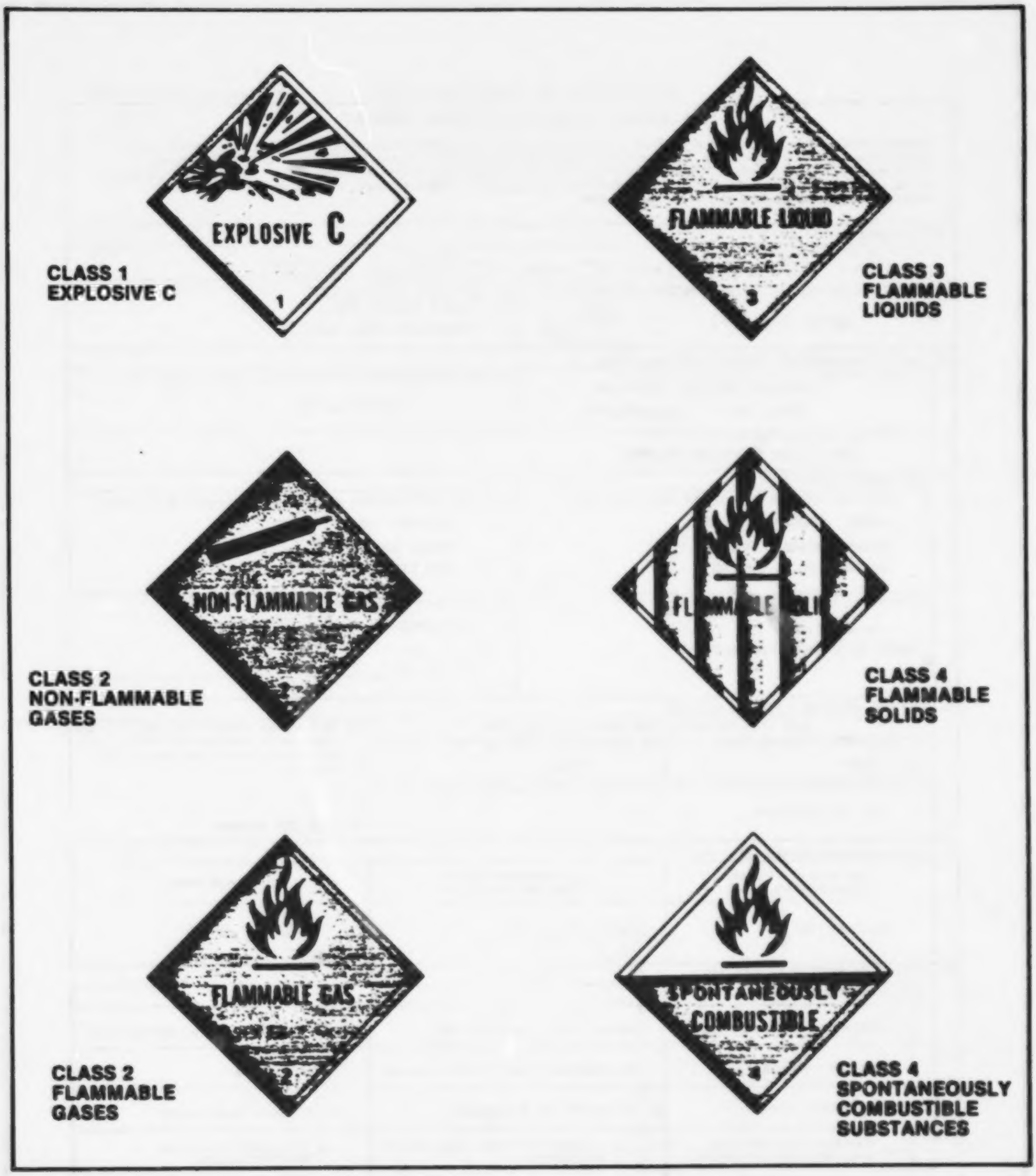
1QT LTD QTY

SHIPPER Use ball point pen and press firmly when preparing this form

TEAR HERE
INSTRUCTIONS

Ltd Qty or Limited Quantity entry when product and volume shipped permits and exception from D.O.T. Diamond Labeling.

FIGURE 3-3. EXAMPLES OF SHIPPING PAPERS


EXPLOSIVE C
1
FLAMMABLE LIQUID
3
NON-FLAMMABLE GAS
2
FLAMMABLE SOLID
4
FLAMMABLE GAS
2
SPONTANEOUSLY COMBUSTIBLE
4

CLASS 1
EXPLOSIVE C

CLASS 3
FLAMMABLE
LIQUIDS

CLASS 2
NON-FLAMMABLE
GASES

CLASS 4
FLAMMABLE
SOLIDS

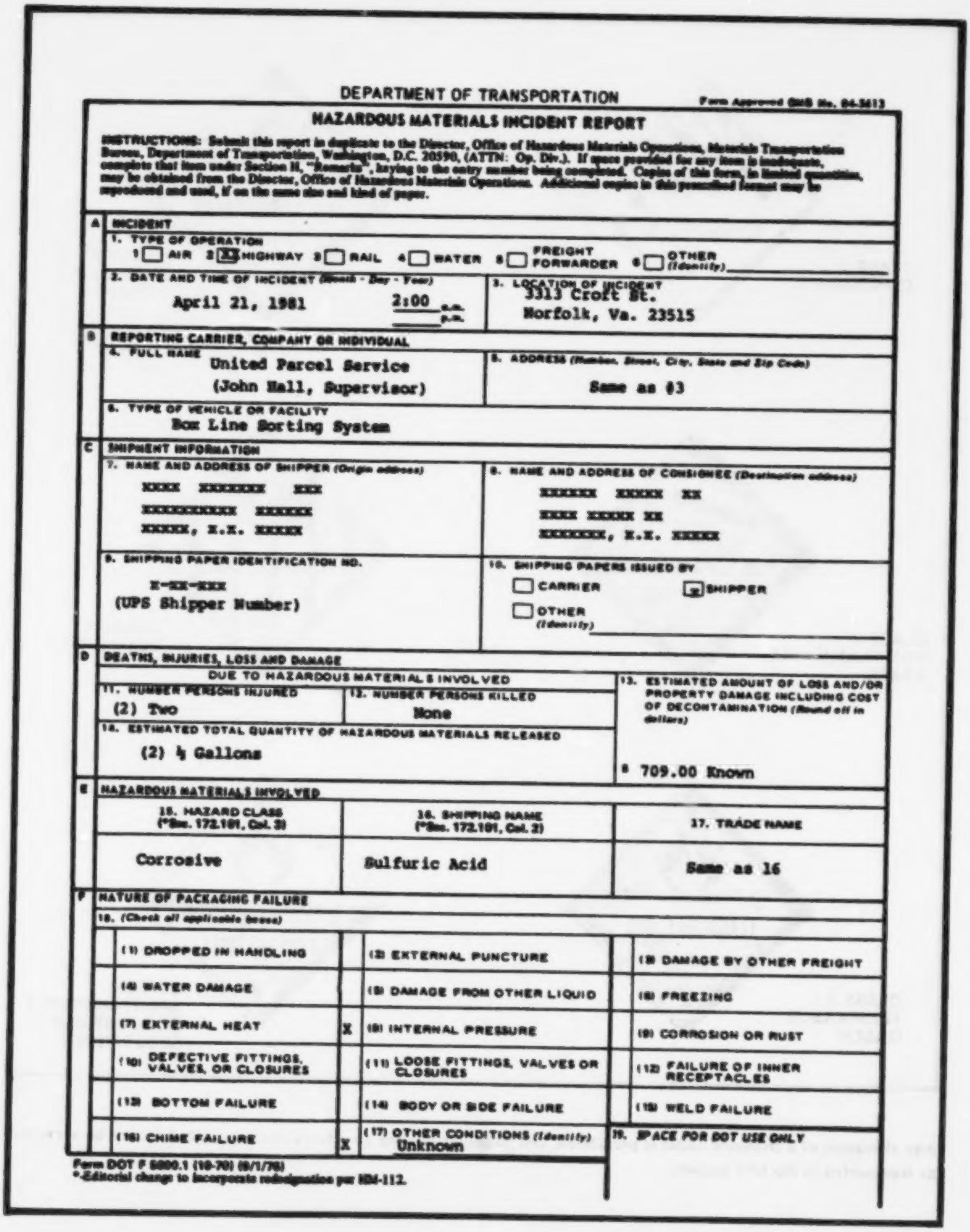
CLASS 2
FLAMMABLE
GASES

CLASS 4
SPONTANEOUSLY
COMBUSTIBLE
SUBSTANCES

Any alteration of a Diamond Label is prohibited, and packages bearing an altered Diamond Label cannot be accepted or transported in the UPS system.

FIGURE 3-4. EXAMPLES OF WARNING LABELS

SAMPLE OF FORM U7257
(DOT Form F 5800.1)



DEPARTMENT OF TRANSPORTATION

Form Approved OMB No. 04-R4113

HAZARDOUS MATERIALS INCIDENT REPORT

INSTRUCTIONS: Submit this report in duplicate to the Director, Office of Hazardous Materials Operations, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590, (ATTN: Op. Div.). If space provided for any item is inadequate, complete that item under Section H, "Remarks", keying to the entry number being completed. Copies of this form, in limited quantities, may be obtained from the Director, Office of Hazardous Materials Operations. Additional copies in this prescribed format may be reproduced and used, if on the same size and kind of paper.

A INCIDENT

1. TYPE OF OPERATION
1 ☐ AIR 2 ☒ HIGHWAY 3 ☐ RAIL 4 ☐ WATER 5 ☐ FREIGHT FORWARDER 6 ☐ OTHER *(Identify)*

2. DATE AND TIME OF INCIDENT *(Month - Day - Year)*
April 21, 1981 2:00 a.m. / p.m.

3. LOCATION OF INCIDENT
3313 Croft St.
Norfolk, Va. 23515

B REPORTING CARRIER, COMPANY OR INDIVIDUAL

4. FULL NAME
United Parcel Service
(John Hall, Supervisor)

5. ADDRESS *(Number, Street, City, State and Zip Code)*
Same as #3

6. TYPE OF VEHICLE OR FACILITY
Box Line Sorting System

C SHIPMENT INFORMATION

7. NAME AND ADDRESS OF SHIPPER *(Origin address)*
XXXX XXXXXXX XXX
XXXXXXXXXX XXXXXX
XXXXX, X.X. XXXXX

8. NAME AND ADDRESS OF CONSIGNEE *(Destination address)*
XXXXXX XXXXX XX
XXXX XXXXX XX
XXXXXXX, X.X. XXXXX

9. SHIPPING PAPER IDENTIFICATION NO.
X-XX-XXX
(UPS Shipper Number)

10. SHIPPING PAPERS ISSUED BY
☐ CARRIER ☒ SHIPPER
☐ OTHER *(Identify)*

D DEATHS, INJURIES, LOSS AND DAMAGE

DUE TO HAZARDOUS MATERIALS INVOLVED

11. NUMBER PERSONS INJURED
(2) Two

12. NUMBER PERSONS KILLED
None

13. ESTIMATED AMOUNT OF LOSS AND/OR PROPERTY DAMAGE INCLUDING COST OF DECONTAMINATION *(Round off in dollars)*
$ 709.00 Known

14. ESTIMATED TOTAL QUANTITY OF HAZARDOUS MATERIALS RELEASED
(2) ½ Gallons

E HAZARDOUS MATERIALS INVOLVED

15. HAZARD CLASS (*Sec. 172.101, Col. 3)	16. SHIPPING NAME (*Sec. 172.101, Col. 2)	17. TRADE NAME
Corrosive	Sulfuric Acid	Same as 16

F NATURE OF PACKAGING FAILURE

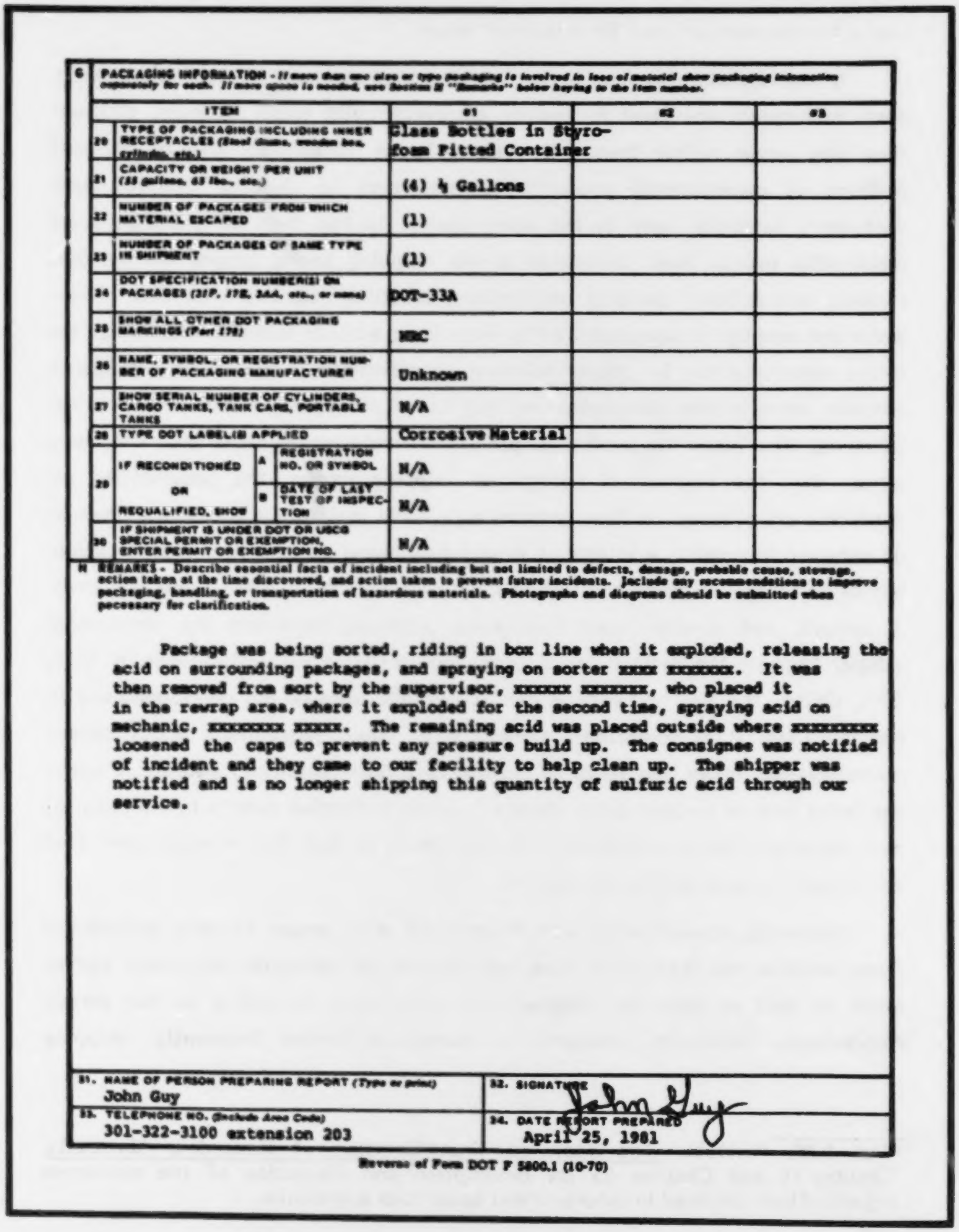
18. *(Check all applicable boxes)*

	(1) DROPPED IN HANDLING		(2) EXTERNAL PUNCTURE		(3) DAMAGE BY OTHER FREIGHT
	(4) WATER DAMAGE		(5) DAMAGE FROM OTHER LIQUID		(6) FREEZING
	(7) EXTERNAL HEAT	X	(8) INTERNAL PRESSURE		(9) CORROSION OR RUST
	(10) DEFECTIVE FITTINGS, VALVES, OR CLOSURES		(11) LOOSE FITTINGS, VALVES OR CLOSURES		(12) FAILURE OF INNER RECEPTACLES
	(13) BOTTOM FAILURE		(14) BODY OR SIDE FAILURE		(15) WELD FAILURE
	(16) CHIME FAILURE	X	(17) OTHER CONDITIONS *(Identify)* Unknown		19. SPACE FOR DOT USE ONLY

Form DOT F 5800.1 (10-70) (6/1/76)
*-Editorial change to incorporate redesignation per HM-112.

FIGURE 3-5. HAZARDOUS MATERIALS INCIDENT REPORT

SAMPLE OF FORM U7257
(DOT Form F 5800.1)



G PACKAGING INFORMATION - *If more than one size or type packaging is involved in loss of material show packaging information separately for each. If more space is needed, use Section H "Remarks" below keying to the item number.*

	ITEM		#1	#2	#3
20	TYPE OF PACKAGING INCLUDING INNER RECEPTACLES *(Steel drums, wooden box, cylinder, etc.)*		Glass Bottles in Styrofoam Fitted Container		
21	CAPACITY OR WEIGHT PER UNIT *(55 gallons, 65 lbs., etc.)*		(4) ½ Gallons		
22	NUMBER OF PACKAGES FROM WHICH MATERIAL ESCAPED		(1)		
23	NUMBER OF PACKAGES OF SAME TYPE IN SHIPMENT		(1)		
24	DOT SPECIFICATION NUMBER(S) ON PACKAGES *(21P, 17E, 3AA, etc., or none)*		DOT-33A		
25	SHOW ALL OTHER DOT PACKAGING MARKINGS *(Part 178)*		NRC		
26	NAME, SYMBOL, OR REGISTRATION NUMBER OF PACKAGING MANUFACTURER		Unknown		
27	SHOW SERIAL NUMBER OF CYLINDERS, CARGO TANKS, TANK CARS, PORTABLE TANKS		N/A		
28	TYPE DOT LABEL(S) APPLIED		Corrosive Material		
29	IF RECONDITIONED OR REQUALIFIED, SHOW	A REGISTRATION NO. OR SYMBOL	N/A		
		B DATE OF LAST TEST OF INSPECTION	N/A		
30	IF SHIPMENT IS UNDER DOT OR USCG SPECIAL PERMIT OR EXEMPTION, ENTER PERMIT OR EXEMPTION NO.		N/A		

H REMARKS - Describe essential facts of incident including but not limited to defects, damage, probable cause, stowage, action taken at the time discovered, and action taken to prevent future incidents. Include any recommendations to improve packaging, handling, or transportation of hazardous materials. Photographs and diagrams should be submitted when necessary for clarification.

Package was being sorted, riding in box line when it exploded, releasing the acid on surrounding packages, and spraying on sorter xxxx xxxxxxx. It was then removed from sort by the supervisor, xxxxxx xxxxxxx, who placed it in the rewrap area, where it exploded for the second time, spraying acid on mechanic, xxxxxxxx xxxxx. The remaining acid was placed outside where xxxxxxxxx loosened the caps to prevent any pressure build up. The consignee was notified of incident and they came to our facility to help clean up. The shipper was notified and is no longer shipping this quantity of sulfuric acid through our service.

31. NAME OF PERSON PREPARING REPORT *(Type or print)* John Guy	32. SIGNATURE John Guy
33. TELEPHONE NO. *(Include Area Code)* 301-322-3100 extension 203	34. DATE REPORT PREPARED April 25, 1981

Reverse of Form DOT F 5800.1 (10-70)

FIGURE 3-5. HAZARDOUS MATERIALS INCIDENT REPORT (Cont.)

The incremental cost of such paperwork is literally the cost of the paper forms plus a few pennies (or less) for computer usage.

At the opposite extreme is the one-of-a-kind shipment processed manually. Such movements are most commonly associated with small business, although they also occur rather frequently among larger firms who may be shipping samples of experimental products to customers or shipping samples from customer's facilities back to the home plant. In this type of handling, some responsible person must determine proper shipping name, proper UN number, packing instructions, quantity restrictions, labelling requirements, etc. These tasks can usually be accomplished by consulting various manuals. However, the initial determination for proper shipping classification is sometimes ambiguous and any error in that determination may cause subsequent errors in packaging, labelling, etc. Since the number of product formulations is more than 100 times larger than the number of recognized shipping names, the possibilities for confusion are obvious. A few carriers (e.g., UPS) maintain a consulting chemist on retainer to provide a source of expert judgement as to proper classification, but by and large, shippers are left to their own devices to make these decisions. A second, and usually more frustrating problem, confronts the occassional shipper because the definitions of substance classifications established by DOT, EPA, OSHA, the UN, and various carrier organizations do not correspond one to one.* Thus, it is sometimes necessary to make judgements about proper classifications under the rules of several different regulatory bodies. Finally, the rapid rate of technological change in some industries results in a stream of new chemicals being introduced into commerce so fast that manuals are often out of date as soon as they are printed.

Normally, classification and determination of proper handling procedures from manuals can take more than ten minutes for domestic shipments and as much as half an hour for international movements according to the survey respondents. Naturally, whenever a movement recurs frequently, shipping department personnel tend either to commit the necessary information to memory or to record it in a notebook. Thus the average incremental paperwork cost for non-automated firms is usually less than 10 minutes per shipment, but is still much larger than at computerized firms. Occassionally, especially for ocean freight, several hours work and multiple telephone calls to regulatory agencies are necessary.

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*See L.W. Bierlein, Red Book on Transportation of Hazardous Materials, Chapter 11 and Chapter 25 for description and discussion of the numerous organizations involved in international hazardous shipments.

Even when handling familiar goods however, manual procedures produce much higher error rates than automated ones. Some carriers report detected error rates of 2 percent to 8 percent among their small-shipper customers. Most of these errors are of the most trivial nature, such as typos, missing commas, improper abbreviations, etc. Nonetheless, such errors subject the carrier and/or shipper to possible fines and may delay the movement. Correcting these errors costs at least several dollars each, since carrier personnel must telephone the shipper to make certain that errors are corrected on all copies and to attempt to avoid recurrence of the error.

3.5 CONTAMINANTS

A few survey respondents raised questions as to how products containing small quantities of CERCLA-listed hazardous substances should be handled. They pointed out that specifications on many products permit significant concentrations of unreacted ingredients to remain. For example, latex paints may contain up to 1 percent of free monomers, such as acrylates, vinyl acetate, formaldehyde or vinylidene. When such products are shipped in bulk by truck, rail or water, any contaminants present in concentrations of 1 percent may likely exceed 100 pounds. Under the original 1 pound statutory RQs, a vast number of shipments of products not generally regarded as hazardous would have come under regulation.

Fortunately, the RQ levels proposed by EPA in the Federal Register of May 25, 1983, seem to have virtually eliminated this problem for the substances whose RQs were adjusted. RQs for contaminants that are likely to remain in significant concentrations have generally been set at 1000 pounds or higher. In latex paint, for example, the RQs for vinyl acetate, vinylidene chloride, and formaldehyde are 5000, 5000, and 1000 pounds respectively. Thus, even when shipped in bulk, this paint would not require additional labelling or NRC notification in the event of an accident.

The laws of nature are such that most of the common monomers which are dangerous to the environment or to human health in very small concentrations, e.g., vinyl chloride, are also quite reactive. Hence, the products in which they are ingredients seldom contain significant quantities of them in unreacted forms. Concentrations of less than 1 part in 100,000 by weight are the norm. Even tank car lots of products regarded as non-hazardous are unlikely to contain as much as one pound of dangerous unreacted monomers.

Section 171.8 of CFR 49 clearly states that mixtures or solutions containing CERCLA-listed substances at concentrations below the specified limits are exempt from regulation (see Section 1 for definitions of the mixtures and solutions rules). For chemicals with one pound RQs, this concentration limit is one part in 50,000 (0.002 percent) or 20 parts per million (see p. 1-4). Survey respondents who were quite knowledgeable of the chemistry of their products seemed to grasp fairly quickly that there really was no regulatory impact in such cases. However, other respondents who were not chemists, tended to worry more about the possibility that such contaminants might be present in quantities exceeding the RQ.

Because of these usually groundless worries and because, in some instances, contaminants are actually found in concentrations exceeding their RQs, CERCLA RQ labelling requirements may encourage some regulated parties to undertake a certain amount of quantitative analysis. Most respondents felt that such testing would cost at least a few hundred dollars for each product about which there was any doubt as to the presence of an RQ. All respondents were reluctant to guess how many products might need to be tested. They did feel however, that the burden of product testing would be small in relation to that of testing hazardous wastes.

3.6 OTHER COSTS

When this survey was at the planning stage, it was hypothesized that CERCLA might result in the bringing under regulation of a large number of shippers and carriers who had not been previously affected by any hazardous materials transporation laws. It was further hypothesized that because of CERCLA, the newly affected firms might experience significant cost increases in such areas as insurance and spill-clean-up costs and that even those already affected by HMR might incur some premium increases.

Neither hypothesis was supported by the survey respondents. All respondents noted that nearly all of the CERCLA-listed products which are consumed in large quantities are already regulated. Furthermore, no respondent could imagine any sort of business involving a newly listed substance which did not also involve previously regulated substances. Hence, the number of firms whose products would be subject to Federal regulations for the first time was generally expected to be nil.

Moreover, the production quantities of the newly listed products are small in relation to those of previously regulated materials. That is, nearly all the Clean Water Act Section 311 hazardous substances are high production substances (greater than 10 million parts per year) and these have already been incorporated into the 49CFR172.101 Hazardous Materials Table). Hence, the impact on insurance, clean-up and other miscellaneous costs is virtually unmeasurable. Respondent firms of any size generally carried liability and clean-up coverages with deductibles of $300 thousand or more, $1 million being the sum most commonly named. Because the newly listed substances tend to move in relatively small quantities and because they seldom possess characteristics of acute toxicity or other imminent danger, the range of costs expected to be incurred when they are spilled is much less than $300 thousand.

Hence, there is no expectation of increased insurance premiums. The vast majority of spills of the newly listed substances will be cleaned up with absorbent by in-house personnel and turned over to the same disposal contractors already being retained.

4.0 SPILL REPORTING AND CLEANUP

Except for the smallest firms, all survey respondents had some personal experience with spills of hazardous materials and hazardous substances during the past few years. Numbers of reported spills in the past year ranged from about one for the smaller firms or single plants of large firms to around a hundred company-wide for the major corporations. Table 4-1 shows the number of reported spills for each of them.

The vast majority of reported spills are cleaned up by in-house personnel using absorbent which is placed in drums for subsequent disposal. Out-of-pocket costs typically range from less than a hundred dollars to about $3 thousand depending upon the quantity, toxicity, and location of the spill. Reporting these minor spills usually requires less than one hour of staff time.

More serious accidents can cost from about $3 thousand (the minimum at which an outside clean-up contractor is likely to be hired) to many millions. Several respondents pointed out that a number of serious incidents with which they have dealt did not result in reports to the NRC because no hazardous substances were actually spilled. Most of these incidents were truck accidents where the possibility of leakage existed and to which emergency response teams were dispatched.

Two respondents had experiences with major disasters - one with a ruptured tank car of a product containing dioxin, the other with the Texas City explosion. Such accidents as these can give rise to endless liability suits and incalculable labor years of effort.

Reporting Criteria and Procedures

Spill reporting criteria and policies varied widely among the respondents with the result that the ratio of NRC-reported spills to total spills varied by a factor of more than 100 across the survey population (see Table 4-1). This variability was caused by three fundamentally different approaches to spill reporting.

TABLE 4-1. SPILL REPORTING PROCEDURES

Shippers	Number of Spills Reported in Past Year	Reporting Criteria	NRC Contact Procedures
1. Bartlett Chemical	1	Report all spills.	Vice President calls NRC if Louisiana State Police have not already done so.
2. Delta Commodities	0	Any spill which produces visible slick, even if less than RQ.	Employee on duty calls Coast Guard, which calls NRC.
3. Exxon USA	10 in Exxon trucks 60 in carrier trucks	For Exxon trucks, report only of RQ exceeded, carriers make decision for their own trucks.	Truck driver calls terminal manager, who calls Houston headquarters staff, which calls NRC if necessary.
4. Fisher Scientific	50-60	Carrier makes decision.	Carriers' responsibility.
5. Grace/Organic Chemical Division	0	Carrier makes decision.	Carrier's responsibility; Grace double checks.
6. Monsanto	100	Monsanto reports all spills on company property; otherwise, carrier makes decision.	Carrier's responsibility.
7. Union Carbide/ Ethylene Oxide Div.	1-2	Carrier makes decision except if on Union Carbide property or in company tank car; company reports all spills under those conditions.	Employees on duty call NRC if spill occurs on Union Carbide property.
8. Union Etchants	0	No established policy.	No established policy.

TABLE 4-1. SPILL REPORTING PROCEDURES (Cont.)

Shippers	Number of Spills Reported in Past Year	Reporting Criteria	NRC Contact Procedures
1. Boston & Maine Railroad	80	Report all spills.	Dispatcher on duty calls NRC.
2. DSI	1	Report only if RQ spilled. Weigh trucks to determine spill size.	DSI personnel and state police make joint decision on whether to call NRC.
3. Lykes Bros. Steamship	5-10	Prefer to report only if spill exceeds RQ, but Louisiana State Police make final decision.	Lykes personnel report all spills in Louisiana to State Police and Coast Guard, which call NRC.
4. Roy Bros. Trucking	0	Report all spills.	Dispatcher would call NRC.
5. St. Johnsbury Trucking	4-6	Report all spills.	Employee on duty calls NRC.
6. Strachan Shipping	0	Louisiana State Police makes decision.	Employee calls State Police and Coast Guard. State Police and NRC if necessary.
7. United Parcel Service	1 (out of 123 incidents)	Report only if RQ exceeded.	Terminal employees call UPS headquarters where RQ is checked. NRC called only if necessary.

At one extreme are the firms whose policy is to report all spills. Managers at these companies feel that the burdens of reporting are so small and the potential liabilities from under-reporting so large that it would be imprudent to do otherwise. These establishments charge relatively low-ranking employees (foremen, dispatchers, etc.) with the responsibility for calling the NRC.

The intermediate position is that taken by firms who leave the reporting decision to an outside authority, e.g., state police or Coast Guard. (Most shippers report that the decision is out of their control, unless the spill occurs on company property or from a company-owned vehicle or vessel.) Low-ranking supervisors are instructed to call these local authorities first. After these officials have made an inspection of the spill, they call the NRC at their own discretion or direct carrier personnel to do so. Several respondents noted that they were required by the local ordinances to follow this practice and that the standards for calling local authority were much stricter than those for calling the NRC. For example, the Coast Guard requires that it be notified of any spill which produces a visible sheen (see 33CFR151 and 40CFR110), regardless of the RQ of the substance in question. By and large, however, these firms were happy to have the local authority assume this responsibility. All of the respondents doing business in Louisiana were complimentary of that state's police officers who were specially trained to deal with hazardous material and hazardous substance emergencies.

The third cluster of respondents consists of those concerns in which spills are reported first to some executive, usually at division or corporate headquarters, who decides whether to call the NRC. These executives take RQs into consideration explicitly. In a business in which spill quantities are usually known fairly accurately, this sort of procedure can drastically reduce the number of calls to the NRC. At UPS, for example, of the 123 spill incidents reported to corporate headquarters in the first five months of 1983, only one resulted in a call to the NRC. In general, the firms who exercise this screening function tend to be large and possessed of highly knowledgable staff specialists. These specialists have often worked directly with government staff in developing reporting requirements and thus have a thorough understanding of the intent of the regulations.

5.0 CONCLUSIONS

CERCLA currently identifies and requires notification for the release into the environment of about 700 hazardous substances including most of the high-volume products used in industry and agriculture. Therefore, one might expect CERCLA reporting requirements to have a substantial impact on the cost of transportation of those products. Interviews with 15 shippers and carriers, representing a broad spectrum of firms affected by CERCLA, have shown that this is not the case. For the reasons summarized below, most firms will find the impact of CERCLA on product shipment costs is too small to measure:

1. Virtually all of the high-volume products listed under CERCLA were already subject to Federal Hazardous Material Regulations. The only new requirements imposed by CERCLA are the stamping or printing of "RQ" on shipping labels as appropriate and spill reporting to the NRC.

2. The products proposed for listing under CERCLA which have not previously been subject to HMR are of relatively little importance in commerce. They move in such small quantities that virtually none of them have individual STCC (Standard Transportation Commodity Classification) Codes. Among the shippers in the survey, only one, Fisher Scientific, had any of the newly listed substances among its products. Most of the carrier personnel did not recognize any of the newly designated substance names. Those who did were confident that shipments of such products amounted to less than 0.1 percent of their total traffic in hazardous goods.

3. All survey respondents, but the smallest, had established procedures and personnel to deal with hazardous shipments. In no case was there any distinction or special staffing for hazardous substances as opposed to hazardous materials. The activities mandated by CERCLA were universally viewed as incremental expansions of existing duties which would not require additional staffing.

4. No survey respondent could imagine any practical production process involving hazardous substances which did not also involve hazardous materials. It is doubtful that any firms exist whose product shipments are subject to regulation solely because of CERCLA.

5. The principal burden imposed by incorporating CERCLA hazardous substances into the HMR on product shipments is simply the labeling of packages with "RQ." For most high-volume shippers, this amounts to a one-time cost for modification of computer programs, usually no more than a few hundred dollars. Very large firms with thousands of products may spend several thousand dollars on this task. Incremental costs are essentially unmeasurable when the "RQ" designation is added to an existing label, but could amount to a few cents per package if a separate label were used. Substantial incremental costs are likely to be incurred only when the shipper, e.g., the proprietor of a small-business, must search through multiple references trying to determine the proper shipping name of a trade-named product and then determine its RQ.

6. The issue of subjecting non-hazardous products to regulation because of small concentrations of hazardous substances does not seem to be particularly significant. Although many product specifications permit concentrations of certain unreacted ingredients up to 1 percent, the chemicals allowed under such loose standards are either non-hazardous or have relatively high RQs. Conversely, chemicals with one pound RQs are rarely present as contaminants at concentrations above one part in 50,000. Thus a package or bulk shipment would rarely contian an RQ. No survey respondent was aware of any product shipments made or handled by his/her company which would be subject to CERCLA solely because of contaminants.

7. The only cost concern widely expressed by the respondents was that as a result of incorporating CERCLA substances into the HMR, MTB might raise packaging standards for the listed chemicals. Such action

could increase costs several dollars on small shipments and perhaps necessitate the complete replacement of some containers used for bulk movements.

8. While spill reporting criteria and policies varied widely among the respondents, most firms interviewed were aware of reporting requirements both for DOT Hazardous Materials and EPA (CERCLA) Hazardous Substances.

9. Some small firms may remain unaware of CERCLA and/or HMR requirements until cited for violations by enforcement officials. These firms may be fined several hundred dollars each - enough to generate substantial antipathy toward the regulations, but not to affect their profitability significantly.

APPENDIX A

INTERVIEW FORMS FOR SHIPPERS

Small business (32 employees)
distributing laboratory and industrial
chemicals in region near New Orleans.

INTERVIEW FORM FOR SHIPPERS

1. **Company Name:** Bartlett Chemical Company
   Address: Box 50730, 1460 S Peters Street
   New Orleans, LA 70150
   Respondent Name: Don Biondo
   Telephone: (504) 523-4911
   Title: Vice President

	Hazardous Materials		Hazardous Substances	
	Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
2. Volume of hazardous Shipments (Amount used in Plant if applicable)	40 per day or 9000 per year		No hazardous substances designated by CERCLA	
Rail				
Truck (Motor Freight or	20 by private truck per day			
Private)	20 by common carrier (UPS or LTL) per day			
Barge				
Air				
Small Package				
Other				
Total				

3. **Special Staff for Hazardous Shipments** No full time
   -Number of persons
   -Professional equivalent of one labor year including shipping, chemist, etc.
   -Clerical
   -Part Time/Full Time

	Hazardous Materials	Hazardous Substances
-Training		
-What types?	Send 3 persons each year to one or one and a half day training seminars conducted by Lyons	
-Time		
-Cost	$600 per year	
-How often?		
4. Incremental Costs of Paperwork for Hazardous Shipments:		
Rail Motor Freight	Approximately one minute of extra paper work time per shipment to comply with regulations.	
Barge		
Air		
Small Package		
Other		
Total		
How do these costs vary with quantity and type of material?	Packing requirements are key variable.	
5. Insurance Practices and Costs Associated with Hazardous Shipments?		
-Type		
-Cost	No effect.	
-Incremental Costs affected by designation of additional substances:		
-Is cost related to type of material volume shipped,		

	Hazardous Materials	Hazardous Substances
6. How are costs affected by bulk vs packaged goods?	Bulk containers are dedicated to a particular chemical and have permanent labels. Small packages take more time.	
7. General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	It is good that no special label is required for ORME. Otherwise truckers get confused and try to apply surcharges.	
8. What changes have occurred because of the Clean Water Act?	None,unless carriers raised rates because of it.	
9. Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have you made already as a result of CERCLA, especially new instructions to personnel?	Not aware, but scheduled to attend DOT-sponsored seminar at which expects to hear matter discussed. No changes likely.	
10. How would you be affected if all of the CERCLA substances were added to the MTB list?	No effect.	

		Hazardous Materials	Hazardous Substances
11.	What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Usual training, retro-fitting/replacing trucks with better valves and hoses. No effect if added to MTB list.	
12.	How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	Report all spills because regulations too vague as to when not to report. Mr. Biondo calls NRC if state police have not already done so. DOT F5800.1	
13.	What spills have you reported in the past year and to whom?	Only one reported to NRC and DOT	
14.	Who is responsible for cleanup of spills?	One small spill cleaned up with absorbent by Barlett Chemical employees.	
15.	Please suggest names of other persons in company with whom these questions should be discussed:		
15.	Please list the highest volume materials and substances you handle. Substance (names or classes)	About 300, of which water treatment chemicals make up the greatest bulk	

Liquid Bulk Terminal Operation
75 employees
1.5 X 10^6 bbl total storage capacity

INTERVIEW FORM FOR SHIPPERS

1.	**Company Name:**	Delta Commodities
	Address:	Box 581, 3540 River Road, Harvey, LA 70059
	Respondent Name:	Ed Guirovich
	Telephone:	(504) 340-4911
	Title	Safety Manager

		Hazardous Materials		Hazardous Substances	
		Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
2.	Volume of hazardous Shipments (Amount used in Plant if applicable)	5 million bbl/year thruput 50 shipments per day		none	
	Rail				
	Truck (Motor Freight or Private)	Inbound by barge and rail Outbound by ship			
	Barge				
	Air				
	Small Package				
	Other				
	Total				

3. Special Staff for Hazardous Shipments

-Number of persons	
-Professional	Part time environmental coordinator does most training himself
-Clerical	
-Part Time/Full Time	

	Hazardous Materials	Hazardous Substances
-Training -What types? -Time -Cost -How often?	few hous per year per employee cost: less than 0.5% of revenues, difficult to break out costs.	
4. Incremental Costs of Paperwork for Hazardous Shipments: Rail Motor Freight Barge Air Small Package Other Total	Very small because all bulk (except samples); rely on producers for descriptions; spend no more than 2 minutes per shipment for extra paperwork to comply with hazardous materials regulations, biggest problems are with small shipments because hard to justify inventory of special packaging.	
How do these costs vary with quantity and type of material?	Almost all bulk.	
5. Insurance Practices and Costs Associated with Hazardous Shipments? -Type -Cost -Incremental Costs affected by designation of additional substances: -Is cost related to type of material volume shipped,	Water pollution insurance is main cost, but not affected by CERCLA	

		Hazardous Materials	Hazardous Substances
6.	How are costs affected by bulk vs packaged goods?	Small shipments (samples) are most costly but send fewer than 10 per year of hazardous materials.	
7.	General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	RQ's too low for low-hazard substances.	
8.	What changes have occurred because of the Clean Water Act?	Waste treatment plant costs about 10% of Delta's total revenue.	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have you made already as a result of CERCLA, especially new instructions to personnel?	Yes, but no effects.	
10.	How would you be affected if all of the CERCLA substances were added to the MTB list?	No effects.	

	Question	Hazardous Materials	Hazardous Substances
11.	What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Hose breaks are most common cause of spills, typically about 20 gallons. New hoses less likely to break. No effects from CERCLA.	
12.	How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	Coast Guard says any spill that produces a visible slick is reportable even if much less than RQ. Employees on duty at time of spill report to CG which in turn calls NRC and local authorities. DOT F 5800.1	
13.	What spills have you reported in the past year and to whom?	No spills in last year, several years since last spill (hose break). Have reported several oil slicks near Delta's docks but not caused by Delta.	
14.	Who is responsible for cleanup of spills?	Would use contractor for spills in water, in-house for small spills on ground.	
15.	Please suggest names of other persons in company with whom these questions should be discussed:		
15.	Please list the highest volume materials and substances you handle. Substance (names or classes)	Tallow, molasses, lubricants, toluene diaso cynanate	

INTERVIEW FORM FOR SHIPPERS

1. Company Name: Exxon Co. USA
   Address: 800 Bell Street, Houston, TX
   Respondent Name: Mike Fuson, et al
   Telephone: (713) 656-4918
   Title: Environmental Coordinator

	Hazardous Materials		Hazardous Substances	
	Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
2. Volume of hazardous				
Shipments	1.1 X 10^6 bbl/day thru put		Very small; no products, only internal uses	
(Amount used in Plant				
if applicable)	4 X 10^6 bbl/day total transported			
Rail	50 rail cars per day			
Truck (Motor Freight or Private)	Several thousand deliveries per day (mostly non-company trucks)			
Barge				
Air				
Small Package				
Other	pipelines >1 MBD			
Total	ships >1 MBD			

3. Special Staff for Hazardous Shipments
   - Number of persons: One labor year equivalent at headquarters, but lots of disbursed responsibilities for safety. Compliance with safety regulations probably amounts to about 1% of total cost of transportation
     - Professional
     - Clerical
     - Part Time/Full Time

	Hazardous Materials	Hazardous Substances
-Training	One day every year plus 3 days every three years plus brief sessions amounting to about one day per year for all employees handling hazardous materials. Amounts to another 1% or more of the cost of transportation.	
-What types?		
-Time		
-Cost		
-How often?		
4. Incremental Costs of Paperwork for Hazardous Shipments:	Incremental costs extremely small because of bulk movements and automated procedures. Changes in regulations impose substantial one-time costs, however largest cost is that of communicating change in regulation throughout a very large firm like Exxon.	
Rail Motor Freight		
Barge		
Air		
Small Package		
Other		
Total		
How do these costs vary with quantity and type of material?	All bulk.	
5. Insurance Practices and Costs Associated with Hazardous Shipments?		
-Type		
-Cost	Very large deductible, essentially self-insured.	
-Incremental Costs affected by designation of additional substances:		
-Is cost related to type of material volume shipped,		

		Hazardous Materials	Hazardous Substances
6.	How are costs affected by bulk vs packaged goods?	Virtually all bulk. Bulk movements much cheaper than packages.	
7.	General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	Main problems are with wastes. Waste disposal requires much more detailed description than is the case for products. State regulations often much more restrictive than Federal.	
8.	What changes have occurred because of the Clean Water Act?	Must obtain NADES permits, many oil/water separators installed, monitors and dikes at terminals; Spill Prevention Control and Countermeasure Plans developed for each terminal. Cost about $40 million for 80 terminals.	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have you made already as a result of CERCLA, especially new instructions to personnel?	Yes, but do not ship any products affected by CERCLA.	
10.	How would you be affected if all of the CERCLA substances were added to the MTB list?	No effects.	

		Hazardous Materials	Hazardous Substances
11.	What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Spent about $2 million retrofitting head shields on tank cars. Spent about few million to upgrade truck fleet (valves, hoses, etc.) No effect from CERCLA.	
12.	How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	If common carrier, decision is up to carrier If Exxon-owned truck, driver reports to terminal manager who reports to Houston; official in Houston will notify NRC only if RQ spilled. Quantity spilled usually known because contents of truck measured before spill and remeasured after accident.	
13.	What spills have you reported in the past year and to whom?	10 spills in Exxon trucks in 1982. 60 spills in non-Exxon trucks in 1982.	
14.	Who is responsible for cleanup of spills?	Use contractor for larges cleanups but have Response Teams ready to go to scene of accidents when needed. Use absorbent for small spills.	
15.	Please suggest names of other persons in company with whom these questions should be discussed:		
15.	Please list the highest volume materials and substances you handle. Substance (names or classes)	All petroleum products.	

INTERVIEW FORM FOR SHIPPERS

				Laboratory equipment and supplies Sales: $500 million/year	
1.	Company Name:	Fisher Scientific			
	Address:	Fairlawn Industrial Park, Fairlawn, N.J.			
	Respondent Name:	Bob McElroy		Allen Sabol, 711 Forbes Ave., Pittsburgh, PA 15219	
	Telephone:	(201) 796-7100		(412) 562-8300	
	Title	Manager of Hazardous Materials Packaging		Director of Transportation	
		Hazardous Materials		Hazardous Substances	
		Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
2.	Volume of hazardous Shipments (Amount used in Plant if applicable)	30 million pounds of chemicals per year move from Fisher's plants to its 35 North American distribution centers in about 2000 truck shipments (mostly LTL). From these centers, about 1.5 million shipments to customers are made, mostly UPS (average weight 20 pounds).		a few thousand shipments/year	
	Rail				
	Truck (Motor Freight or Private)				
	Barge				
	Air				
	Small Package				
	Other				
	Total				
3.	Special Staff for Hazardous Shipments				
	-Number of persons	3 full time professionals & secretary; $250K per year; prepare and update procedures manuals, conduct training, test packaging, etc.			
	-Professional				
	-Clerical				
	-Part Time/Full Time				

	Hazardous Materials	Hazardous Substances
-Training	1000 persons-days per year or about $175,000 per year for time or 3 days per person per year. Training conducted by Fisher personnel. (Fisher also sells manuals on handling procedures.)	
-What types?		
-Time		
-Cost		
-How often?		
4. Incremental Costs of Paperwork for Hazardous Shipments:		
Rail Motor Freight		
Barge	Very small because all automated except for air shipments. Less than 5¢ per shipment for paperwork. Computer generates all documents and displays packaging and shipping instructions for each item sold.	
Air		
Small Package		
Other		
Total		
How do these costs vary with quantity and type of material?	All small package	
5. Insurance Practices and Costs Associated with Hazardous Shipments?		
-Type	No effects.	
-Cost		
-Incremental Costs affected by designation of additional substances:		
-Is cost related to type of material volume shipped,		

		Hazardous Materials	Hazardous Substances
6.	How are costs affected by bulk vs packaged goods?	Small packages are more expensive. Fisher has its own standards, often higher than DOT.	
7.	General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	No complaints. Respondent (30 years experience) understands CFR49 very well.	
8.	What changes have occurred because of the Clean Water Act?	None.	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have you made already as a result of CERCLA, especially new instructions to personnel?	Yes - only 15 Fisher products have one pound RQ's. Those with higher RQ's are not affected since Fisher does not ship them in packages of sufficient size to fall under regulation. Computer programs have been changed to reflect CERCLA for those 15.	
10.	How would you be affected if all of the CERCLA substances were added to the MTB list?	No effects.	

	Hazardous Materials	Hazardous Substances
11. What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Fisher already has higher standards than DOT requires and is moving toward introduction of a new type of foam packaging for glass bottles which should greatly reduce the possibility of breakage and leaks.	
12. How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	Carrier's responsibility; Fisher has never called NRC for transportation spill.	
13. What spills have you reported in the past year and to whom?	682 incidents involving Fisher products have been reported to DOT in past 12 years; mostly dropped packages; mostly UPS. 2 trucks carrying large shipments of Fisher products were wrecked in past year but no chemicals spilled.	
14. Who is responsible for cleanup of spills?	Carriers are responsible, but if truck wreck occurs, Fisher will dispatch emergency response team.	
15. Please suggest names of other persons in company with whom these questions should be discussed:		
15. Please list the highest volume materials and substances you handle. Substance (names or classes)	10,000 chemical items in Fisher catalog, of which 60% classified hazardous.	

INTERVIEW FORM FOR SHIPPERS

1. **Company Name:** W.R. Grace & Co., Organic Chemicals Division

Address: 55 Hayden Avenue, Lexington, MA 02173

Respondent Name:	J.D. Feagin	Dr. Peter Matonas
Telephone:	(617) 861-6600	(617) 861-6600
Title	Traffic Manager	Director, Environmental Affairs

	Hazardous Materials		Hazardous Substances	
	Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
2. Volume of hazardous Shipments (Amount used in Plant if applicable)			About 500 tank truck shipments per year of produc listed under CERCLA, but these were already subject to HMR. About 3 or 4 shipments per year of wastes which were not subject to regulation prior to CERCLA.	
Rail (tank cars, NH_3)	100	None		
Truck (Motor Freight or Private) tank, dry bulk	650 100			
Barge				
Air	50			
Small Package	100			
Other				
Total	1000			
3. Special Staff for Hazardous Shipments				
-Number of persons				
-Professional	.25 LY		.25 LY	
-Clerical				
-Part Time/Full Time				

		Hazardous Materials	Hazardous Substances
	-Training	All affected personnel briefed at least once a year by Mr. Feagin and purchased training materials and seminars ($5K per year)	
	-What types?		
	-Time		
	-Cost		
	-How often?		
4.	Incremental Costs of Paperwork for Hazardous Shipments:		
	Rail/Motor Freight	Very small (5¢ per bill of lading for bulk shipments)	
	Barge		
	Air		
	Small Package	Several dollars per package.	
	Other		
	Total		
	How do these costs vary with quantity and type of material?	Small packages and special items (e.g. customer samples) much more expensive than regular bulk shipments. Where required, labels cost $1 to $2 per container.	
5.	Insurance Practices and Costs Associated with Hazardous Shipments?	Essentially nil.	
	-Type		
	-Cost		
	-Incremental Costs affected by designation of additional substances:		
	-Is cost related to type of material volume shipped,		

		Hazardous Materials	Hazardous Substances
6.	How are costs affected by bulk vs packaged goods?	Small packages are much more affected than bulk goods.	
7.	General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	Inconsistencies among various regulatory agencies as to definitions and classifications create numerous problems, e.g. difference between EPA "ignitable" and DOT "flammable" standards; should a spilled product be considered a "waste"?	
8.	What changes have occurred because of the Clean Water Act?	None for transportation at Grace.	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have you made already as a result of CERCLA, especially new instructions to personnel?	Yes. Briefing affected personnel regarding CERCLA now. Adding warning message on all shipping lables to call NRC if spill occurs.	
10.	How would you be affected if all of the CERCLA substances were added to the MTB list?	Depends on RQ. Many products could contain traces of hazardous substances exceeding one pound out of a bulk container (e.g. tank car). Much analysis, calculation and paperwork could be avoided if RQs set above 100 pounds.	

		Hazardous Materials	Hazardous Substances
11.	What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Extensive training program, monthly exercises dealing with simulated emergencies. Extremely detailed procedures for every step inthe shipment of Class A toxics (procedures manual for HCN is more than 2" thick).	
12.	How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	Determination made by carrier personnel, who have prime responsibility for reporting. Grace personnel would check to be sure NRC had been notified.	
13.	What spills have you reported in the past year and to whom?	None.	
14.	Who is responsible for cleanup of spills?	Grace Distribution Co., or other specialized clean-up contractors.	
15.	Please suggest names of other persons in company with whom these questions should be discussed:		
15.	Please list the highest volume materials and substances you handle. Substance (names or classes)	CN solutions in bulk. NH_3 EDTA	Only 4 products are classed as hazardous substances, but many raw materials are. None of these have low RQ's.

INTERVIEW FORM FOR SHIPPERS

1. Company Name: Monsanto Company
   Address: 800 N. Lindbergh Avenue
   Respondent Name: St. Louis, Missouri 63166
   Telephone: Stanley Brand, (314) 694-5605
   Title: Manager, Emergency Response Team

	Hazardous Materials		Hazardous Substances	
	Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
2. Volume of hazardous Shipments (Amount used in Plant if applicable)	Approximately 15 billion pounds per year.		Very little of hazardous substances.	
Rail	Shiploads to UPS breakdown not available			
Truck (Motor Freight or Private)				
Barge				
Air				
Small Package				
Other				
Total				

3. Special Staff for Hazardous Shipments -Number of persons -Professional -Clerical -Part Time/Full Time	- involves medical, legal, etc., probably more than 100 labor years equivalent in company size of Monsanto ($7 billion sales in 1981). - have produced more than 12" of procedures manuals for transportation of hazardous materials.

	Hazardous Materials	Hazardous Substances
-Training -What types? -Time -Cost -How often?	30 hours per year per person working in transportation 12 hours per year for persons who are members of emergency response teams. cost of training is not available but certainly exceeds $1 million per year. transportation workers get one 2-day seminar each year and update briefing every other month.	
4. Incremental Costs of Paperwork for Hazardous Shipments:		
Rail Motor Freight	Very small for most products because all paperwork generated by computer. Software cost 2 labor-year's programmer time to generate and requires 0.5 LY to maintain and update.	
Barge		
Air		
Small Package	Small packages (samplers) cost several dollars each to prepare and document because procedures are not automated.	
Other		
Total		
How do these costs vary with quantity and type of material?		
5. Insurance Practices and Costs Associated with Hazardous Shipments?		
-Type		
-Cost	No effects, very large deductible.	
-Incremental Costs affected by designation of additional substances:		
-Is cost related to type of material volume shipped,		

		Hazardous Materials	Hazardous Substances
6.	How are costs affected by bulk vs packaged goods?	Does not matter for regular products	
7.	General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	Not a problem for products, but ORM-E wastes are very hard to classify and often over classified; analysis costs $200 - $300 per drum.	
8.	What changes have occurred because of the Clean Water Act?	Biggest costs are lawsuits.	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CER[illegible]A? What changes have you made [illegible] a result of CERCLA, esp[illegible]ally [illegible]ew instructions to personnel?	Yes, but very little effect since all Monsanto products listed under CERCLA already regulated. RCRA had much larger cost impact than CERCLA.	
10.	How would you be affected if all of the CERCLA substances were added to the MTB list?	No effect on Monsanto; good idea to make this consistent. But if RQ's set too low lots of items will have to be listed on bill of lading. A long complex description on the bill of lading can be very confusing to a fireman or policeman trying to cope with an emergency. Respondent cited several instances of errors in reading labels by firemen.	

		Hazardous Materials	Hazardous Substances
11.	What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Usual training, equipment upgrades, etc. No effect if added by MTB.	
12.	How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	Monsanto reports all spills if RQ is present in container even if less than RQ spilled on Monsanto property. Spills in transit supposed to be reported by carrier. DOT F5800.1 if by Monsanto, but lack record of small spills if reported by carrier.	
13.	What spills have you reported in the past year and to whom?	About 100 incidents are reported to DOT each year involving Monsanto shipments, of which about one is a serious accident. Carriers do not routinely send copies of incident reports to Monsanto safety staff.	
14.	Who is responsible for cleanup of spills?	Contractors for large spills, in-house for small spills. Monsanto maintaine many emergency response teams to help with serious accidents.	
15.	Please suggest names of other persons in company with whom these questions should be discussed:		
15.	Please list the highest volume materials and substances you handle. Substance (names or classes)	About 650 different chemicals of which fertilizers make up the greatest tonnage. See attachment 1.	

INTERVIEW FORM FOR SHIPPERS

1. **Company Name:** Union Carbide, Glycol/Ethylene Oxide Division
   Address: Box 50, Hahnville, LA 70057
   Respondent Name: John Dollar and Jerry Darensbourg
   Telephone: (504) 468-4411
   Title Specialist, Marine Activity   DOT Coordinator

2\.

	Hazardous Materials		Hazardous Substances	
	Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
Volume of hazardous Shipments (Amount used in Plant if applicable)	1.5 billion pounds per year		Only butadiene shipments (a few per year).	
Rail	600 per year			
Truck (Motor Freight or Private)	2400 per year			
Barge	1200 million pounds per year			
Air				
Small Package	4600 samples per year			
Other	50,000 drums per year			
Total				

3. Special Staff for Hazardous Shipments
   -Number of persons
      -Professional 1 full time (DOT Coordinator)
      -Clerical 1 part time (Marine Specialist)
      -Part Time/Full Time

	Hazardous Materials	Hazardous Substances
-Training -What types? -Time -Cost -How often?	Purchase training from "GSI" and "Tankerman Training" at cost of few thousand dollars per year. 12 hours per year for 130 employees or about $40K per year for time. Cost is less than 0.1% of value of product produced at this plant.	
4. Incremental Costs of Paperwork for Hazardous Shipments: Rail Motor Freight Barge Air Small Package Other Total How do these costs vary with quantity and type of material?	About 1 minute of clerk's time per shipment on most shipments, but about 15 minutes per shipment for non-routine small packages (samples); about 30 minutes for international small package shipments.	
5. Insurance Practices and Costs Associated with Hazardous Shipments? -Type -Cost -Incremental Costs affected by designation of additional substances: -Is cost related to type of material volume shipped,	Effectively Self insured	

		Hazardous Materials	Hazardous Substances
6.	How are costs affected by bulk vs packaged goods?	Small packages much more expensive than bulk.	
7.	General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	Difficult to understand language of regulations - government should issue manuals with lots of examples and illustrations.	
8.	What changes have occurred because of the Clean Water Act?	No effects on transportation except for added chemicals on Hazardous Materials list.	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have you made already as a result of CERCLA, especially new instructions to personnel?	Yes - only butadienes affected by CERCLA but Union Carbide was already handling these chemicals as hazardous before they were listed so no real effect.	
10.	How would you be affected if all of the CERCLA substances were added to the MTB list?	Very little.	

	Hazardous Materials	Hazardous Substances
11. What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Have already installed new hoses, valves, etc.; no further hardware changes expected.	
12. How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	Report all spills on Union Carbide property; carrier makes own decision to call for goods in transit except when Union Carbide owns the tank car. DTS F 5800.1	
13. What spills have you reported in the past year and to whom?	Have one or two reportable spills per year, see above.	
14. Who is responsible for cleanup of spills?	Carrier personnel usually handle clean up, with advice from Union Carbide. For large spills, especially in river, contractors are retained.	
15. Please suggest names of other persons in company with whom these questions should be discussed:		
15. Please list the highest volume materials and substances you handle. Substance (names or classes)	Glycol, ethylene oxide, tolune, benzene, xylene	

INTERVIEW FORM FOR SHIPPERS

1. **Company Name:** Union Etchants International
   Address: 8 Green Street, Woburn, MA
   Respondent Name: Robert Union
   Telephone: (617) 935-8878
   Title: Proprietor

	Hazardous Materials		Hazardous Substances	
	Total Shipments	Approximate Number Of Spills	Total Shipments	Approximate Number of Spills
2. Volume of hazardous				
Shipments	500	None	None	
(Amount used in Plant if applicable)	None.			
Rail				
Truck (Motor Freight or Private)	300 M/C 200 Private			
Barge				
Air	5-10			
Small Package				
Other				
Total				

3. **Special Staff for Hazardous Shipments** None. (Only three persons total staff)
   - Number of persons
     - Professional
     - Clerical
     - Part Time/Full Time

	Hazardous Materials	Hazardous Substances
-Training	None, learned by experience, much trial and error as to acceptable responses to questions on shipping documents; much inconsistency noted as to requirements of various authorities.	
-What types?		
-Time		
-Cost		
-How often?		
4. Incremental Costs of Paperwork for Hazardous Shipments:		
Rail Motor Freight	10 minutes per shipment domestic.	
Barge	30 minutes per shipment international (mostly Canada)	
Air		
Small Package		
Other		
Total		
How do these costs vary with quantity and type of material?	Not significantly among hazardous group.	
5. Insurance Practices and Costs Associated with Hazardous Shipments?	Negligible.	
-Type		
-Cost		
-Incremental Costs affected by designation of additional substances:		
-Is cost related to type of material volume shipped,		

		Hazardous Materials	Hazardous Substances
6.	How are costs affected by bulk vs packaged goods?	No bulk. Incremental costs for hazardous materials classification very much higher for small shipments.	
7.	General Comments Regarding Incremental Costs of Regulation, expecially ORM-E:	Regulation results in substantial delays in shipping since hazardous products cannot move in trailers carrying foodstuffs, etc.	
8.	What changes have occurred because of the Clean Water Act?		
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have you made already as a result of CERCLA, especially new instructions to personnel?	No effect.	
10.	How would you be affected if all of the CERCLA substances were added to the MTB list?	None.	

		Hazardous Materials	Hazardous Substances
11.	What kinds of actions are now being undertaken to prevent spills? Would these change if more substances were added to the Haz. Mats list?	Plastic bottles inside metal cans inside wooden boxes with absorbent pellets occupying most of the package volume.	
12.	How does company determine if an RQ is spilled? Whom do you call? Who reports? What records are kept?	Have never had a spill. Have no established procedures. Shipment sizes much smaller than RQ for all products.	
13.	What spills have you reported in the past year and to whom?	---	
14.	Who is responsible for cleanup of spills?	---	
15.	Please suggest names of other persons in company with whom these questions should be discussed:	None.	
15.	Please list the highest volume materials and substances you handle. Substance (names or classes)	Iodine and compounds. Hydrochloric, nitric and phosphoric acids. Ferric Chloride. Potassium Cyanide Various other corrosives, some also flammable.	

APPENDIX B

INTERVIEW FORMS FOR CARRIERS

INTERVIEW FORM FOR CARRIERS

1.	Company Name:	Boston & Maine Railroad	
	Address:	Iron Horse Park, Billerica, MA	
	Respondent Name:	Robert Currier	Larry Boyd
	Telephone:	(617) 663-6900	(617) 663-6967
	Title:	Safety Manager	Environmental Engineer
		Hazardous Materials	Hazardous Substances
2.	Volume of Hazardous Shipments (Number per year)? Describe typical packaging and Shipment size:	Full 15,000+ Full carloads +9000 mixed freight with hazardous materials contained	Very few, perhaps none, of substances which are not also hazardous materials. Examination of Appendix D shows that virtually none of the newly regulated substances have STCC codes, which means that they cannot be counted in any existing data base.
3.	Special Staff for Hazardous Shipments	Responsibilities disbursed among numerous operating personnel. Approximately 1/4 time for Safety Manager.	Approximately 1/4 time of Environmental Engineer.
	-Number of Persons		
	-Professional		
	-Clerical		
	-Part Time/Full Time		
	-Training	One hour briefing for each operating employee about once every three years and purchased materials amounting to about $10,000 per year.	
	-Time		
	-Cost		
	-Type		
	-Frequency		

		Hazardous Materials	Hazardous Substances
4.	Incremental Cost of Handling Hazardous Materials including paperwork, operating procedures, etc.:	$25 per pressurized tank car for special switching in classification yard. $1 per car for placards. One hour ($25) per train to notify crew.	Very little incremental cost.
	Does this depend on the type of hazardous material? -bulk vs packaged?	Very little except for pressurized tank cars.	
5.	Insurance Costs Associated with Hazardous Shipments -Type -Cost	Self-insured up to $1 million.	
	-Costs affected by designation of additional substances	No effect for additional hazardous substances.	
6.	General Comments about Incremental Costs of Regulation, Especially ORME		Why are some of them regulated? e.g. dog food?

		Hazardous Materials	Hazardous Substances
7.	What has happened as a result of the Clean Water Act?	Very little direct effect, but did buy new set of tariffs ($2K) and training materials ($1K).	Diesel fuel (most commonly spilled substance) must be cleaned up.
8.	What would happen if all CERCLA substances were added to Haz. Mats. list by MTB?	Not much effect.	Adds to clean up costs because crews must take extra precautions.
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have already been made as a result of CERCLA, especially new instructions to your personnel?	Yes, but very little effect on transportation.	Main effects on fixed facilities, especially waste dumps owned by railroads.
10.	What kinds of actions are now being undertaken to prevent spills? Would these change or expand if more substances were added to the Haz. Mats. list? Give possible examples: (e.g. special training, special handling (prerouting) advance notice of shipment.)	Mainly safety training. Extremely hazardous cargos e.g. cyanide gas, nuclear reactor cores, get special procedures. Pressurized tank cars get special switching i.e. cannot be humped.	Same as hazardous materials if ever carried.

		Hazardous Materials	Hazardous Substances
11.	What actions have you taken in cleaning up actual spills? Would these change if additional substances were added to the Haz. Mats. list? What are the costs?	Hire specialized contractors. 2 serious spills per year 5-10 spills requiring clean up. 60-70 minor leaks, drips, etc. Costs vary widely with substance in question, quantity, and location.	
	Whom do you call in case of a spill? Who contacts the NRC? Please describe actual experiences in past year.	Dispatcher on duty cars NRC, plus local fire department, police, state officials as appropriate.	
12.	How does RQ size affect your actions? How do you decide if the spill is reportable?	Report all spills, usually impossible to tell how much has spilled.	
13.	Can you give us names of shippers to interview?	Monsanto (Everett) Grace (Nashua)	

	Hazardous Materials	**Hazardous Substances**
14. Please list the materials and substances you ship (or classes if too many substances)	See attachment.	

$44 million per year
700 employees
285 tractors
350 trailers

INTERVIEW FORM FOR CARRIERS

1. **Company Name:** DSI (Distribution Systems Inc.)

   Address: Box 1505
   Houston, TX 77001

   Respondent Name: Grady Purtle

   Telephone: (713) 479-0061

   Title: Safety Director

Transports products from Gulf Coast to all U.S. and Canada

	Hazardous Materials	Hazardous Substances
2. **Volume of Hazardous Shipments (Number per year)?**	80,000 per year	<0.1% of all shipments or about 50 per year including: Fluroacetic acid various benzenamines various chlorophenols heptachlorobenzene et al
Describe typical packaging and Shipment size:	all liquid bulk truckloads	

3. **Special Staff for Hazardous Shipments**

-Number of Persons 1

-Professional

-Clerical 1 secretary

-Part Time/Full Time

-Training

-Time
-Cost
-Type
-Frequency

30,000 hours per year or a little over 40 hours per year per employee or $750K per year. New employees receive 3 days classroom training plus 5 days on thejob training and turnover is substantial. 2-3 hours training sessions for all employees are held whenever new regulations are issued.

DSI prepares its own manual of safety procedures (1/2" thick) and also uses ATA and J.J. Keller manuals of safety procedures for trucking.

		Hazardous Materials	Hazardous Substances
4.	Incremental Cost of Handling Hazardous Materials including paper-work, operating procedures, etc.:	Checking paperwork on truckload shipments takes very little time (i.e. only a few minutes per truckload). Error rates are less than 1% overall, but much higher for small shippers. DSI visits shippers who make frequent errors to instruct them. Error rates seem to be declining.	
	Does this depend on the type of hazardous material? -bulk vs packaged?	All bulk	
5.	Insurance Costs Associated with Hazardous Shipments -Type -Cost -Costs affected by designation of additional substances	$300K deductible No effect from CERCLA	
6.	General Comments about Incremental Costs of Regulation, Especially ORME	Very little ORME handled Vagueness in definitions creates problems:	

		Hazardous Materials	Hazardous Substances
7.	What has happened as a result of the Clean Water Act?	$700K per year for water treatment from tank cleaning operations.	
8.	What would happen if all CERCLA substances were added to Haz. Mats. list by MTB?	Very little effect	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have already been made as a result of CERCLA, especially new instructions to your personnel?	Yes. 12 substances carried by DSI are affected by CERCLA. These changes will be discussed in safety training sessions.	
10.	What kinds of actions are now being undertaken to prevent spills? Would these change or expand if more substances were added to the Haz. Mats. list? Give possible examples: (e.g. special training, special handling (prerouting) advance notice of shipment.)	More training, some equipment upgrades. No change resulting from CERCLA Some hazardous materials (e.g. alkyls, pesticide) get special routing but none of the CERCLA substances seem to require it.	

	Hazardous Materials	Hazardous Substances
11. What actions have you taken in cleaning up actual spills? Would these change if additional substances were added to the Haz. Mats. list? What are the costs? Whom do you call in case of a spill? Who contacts the NRC? Please describe actual experiences in past year.	Most spills occur at loading or unloading, involve small quantities and are cleaned up with absorbent by terminal crews. DSI has had only one spill on the highway in past three years in spite of more than a dozen property-damage accidents involving its trucks. Contractor clean-ups generally cost a few thousand dollars each. No changes from CERCLA. In case of highway spill, DSI and/or state police call NRC.	
12. How does RQ size affect your actions? How do you decide if the spill is reportable?	Report only if spill exceeds RQ. Weigh trucks to determine quantity spilled.	
13. Can you give us names of shippers to interview?	All major chemical companies and refineries in Gulf South	

		Hazardous Materials	Hazardous Substances
14.	Please list the materials and substances you ship (or classes if too many substances)	All petrochemicals, acids, caustics, etc.	See #2

INTERVIEW FORM FOR CARRIERS

900 white collar
up to 1000 long shoremen
46 ships and crews

1.	Company Name:	Lykes Brothers Steamship Lines	
	Address:	Box 53068 New Orleans, LA 70153	
	Respondent Name:	Lee McCutchen	
	Telephone:	(504) 523-6611	
	Title:	Traffic Service Manager	
		Hazardous Materials	Hazardous Substances
2.	Volume of Hazardous Shipments (Number per year)?	100,000 tons per year Dispersed among 360 sailing per year from U.S. ports.	probably none
	Describe typical packaging and Shipment sizes	Mostly drums or containerized, some pallets.	
3.	Special Staff for Hazardous Shipments		
	-Number of Persons	Part time responsibilities of various staff members and supervisors.	
	-Professional		
	-Clerical		
	-Part Time/Full Time		
	-Training		
	-Time -Cost -Type -Frequency	200 persons receive one day of training per year (foremen and supervisors). These persons in turn train longshoremen, etc. on the-job. About $10K per year is spent for seminars, audio-visual aids, etc.	

		Hazardous Materials	Hazardous Substances
4.	Incremental Cost of Handling Hazardous Materials including paperwork, operating procedures, etc.:	10,000 hours per year ($250K) devoted to checking paperwork on hazardous shipments and correcting errors. Error rates average 1-2%. U.S. military has highest error rate (mainly illegal combinations of products in same container). Must also brief captain of vessel on hazardous materials in each shipment and proper handling precedures, 1 hour per briefing ($200 for captain and safety specialist).	
	Does this depend on the type of hazardous material?		
	-bulk vs packaged?	Depends on specific container type; some more likely to leak.	
5.	Insurance Costs Associated with Hazardous Shipments		
	-Type	$100K deductible, no change resulting from CERCLA.	
	-Cost		
	-Costs affected by designation of additional substances		
6.	General Comments about Incremental Costs of Regulation, Especially ORME	Vagueness in definitions creates problems. Shipper must make these judgments. Lykes nearly always accepts shipper's decision as to proper classification.	

		Hazardous Materials	Hazardous Substances
7.	What has happened as a result of the Clean Water Act?	Added many chemicals to regulated list	
8.	What would happen if all CERCLA substances were added to Haz. Mats. list by MTB?	Little affect on Lykes	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have already been made as a result of CERCLA, especially new instructions to your personnel?	Yes. Very little affected by CERCLA Must report spills within 200 miles of U.S. coast.	
10.	What kinds of actions are now being undertaken to prevent spills? Would these change or expand if more substances were added to the Haz. Mats. list? Give possible examples: (e.g. special training, special handling (prerouting) advance notice of shipment.)	Mainly training and upgraded standards for containers. No affect from CERCLA	

	Hazardous Materials	Hazardous Substances
11. What actions have you taken in cleaning up actual spills? Would these change if additional substances were added to the Haz. Mats. list? What are the costs? Whom do you call in case of a spill? Who contacts the NRC? Please describe actual experiences in past year.	-Larger spills cleaned up by Petersen Marine; large chemical companies most helpful with clean-up efforts. Spills cost at least a few thousand dollars if contractor involved. When spills occur, (5-10/year) Lykes calls Coast Guard and/or state police. Coast Guard calls NRC. Lykes calls Chemtrec 2 or 3 times per year.	
12. How does RQ size affect your actions? How do you decide if the spill is reportable?	Lykes makes best estimate of spill size and suggests calling NRC only if required. However, Louisiana State Police require that all spills be reported to them and they make final decision as to whether NRC should be called.	
13. Can you give us names of shippers to interview?		

	Hazardous Materials	Hazardous Substances
14. Please list the materials and substances you ship (or classes. If too many substances)	Flammables: solvents lubricants gasoline and kerosene in 55 gallon drums (mainly military) Insecticides Herbicides Ammunition and Dynamite Many Others	

INTERVIEW FORM FOR CARRIERS

1.	Company Name:	Roy Bros. Trucking	
	Address:	764 Boston Road, Billerica, MA	
	Respondent Name:	Leo Roy	
	Telephone:	(617) 667-1921	
	Title:	President	
		Hazardous Materials	Hazardous Substances
2.	Volume of Hazardous Shipments (Number per year)?	9,700	
	Describe typical packaging and Shipment size:	10.4 tons, liquid bulk	
3.	Special Staff for Hazardous Shipments		
	-Number of Persons	None.	
	-Professional		
	-Clerical		
	-Part Time/Full Time		
	-Training	ATA training materials, training seminars every other year	
	-Time		
	-Cost	$1K/year.	
	-Type		
	-Frequency		

		Hazardous Materials	Hazardous Substances
4.	Incremental Cost of Handling Hazardous Materials including paperwork, operating procedures, etc.:	Nearly all shipments handled are hazardous. Most extra costs arise form differences between the states as to paperwork requirements and misunderstandings or inconsistent interpretations by enforcement personnel (e.g. state troopers). Hazardous substance regulations should have very little effect, unless they add to confusion.	
	Does this depend on the type of hazardous material? -bulk vs packaged?	All shipments are bulk.	
5.	Insurance Costs Associated with Hazardous Shipments -Type -Cost -Costs affected by designation of additional substances	Higher limits are in effect for hazardous cargoes, but blanket policy covers all cargoes. No effect for additional substances.	
6.	General Comments about Incremental Costs of Regulation, Especially ORME	Greatest need is for clarity in regulations so that enforcement personnel will understand them and interpret them consistently in different jurisdictions.	

	Hazardous Materials	Hazardous Substances
7. What has happened as a result of the Clean Water Act?	Waste water from tank cleaning operations must be recovered and disposed of properly. Hardware cost $150,000. Disposal service costs $200,000.per year.	
8. What would happen if all CERCLA substances were added to Haz. Mats. list by MTB?	Very little. Acetone is the only substance handled which is affected by CERCLA.	
9. Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have already been made as a result of CERCLA, especially new instructions to your personnel?	Not aware, no actions, no effects.	
10. What kinds of actions are now being undertaken to prevent spills? Would these change or expand if more substances were added to the Haz. Mats. list? Give possible examples: (e.g. special training, special handling (prerouting) advance notice of shipment.)	Driver training. New hoses ($35K). Nothing extremely hazardous handled.	

	Hazardous Materials	Hazardous Substances
11. What actions have you taken in cleaning up actual spills? Would these change if additional substances were added to the Haz. Mats. list? What are the costs? Whom do you call in case of a spill? Who contacts the NRC? Please describe actual experiences in past year.	Clean up small spills with absorbent powder ("Speedi-Dry"). Insurance company pays specialized contractors to clean up large spills resulting from collisions. State troopers call NRC and state authorities in case of collision. Roy Brothers follows up with written report.	
12. How does RQ size affect your actions? How do you decide if the spill is reportable?	Report all spills, ignore RQ's.	
13. Can you give us names of shippers to interview?		

	Hazardous Materials	Hazardous Substances
14. Please list the materials and substances you ship (or classes. If too many substances)	Mainly petrochemicals, also acids and caustics Approximately 100 commodities altogether.	None which are not also hazardous materials.

INTERVIEW FORM FOR CARRIERS

1.	Company Name:	St. Johnsbury Trucking Co.	
	Address:	87 Jeffrey Avenue Holliston, MA 01746	
	Respondent Name:	Chet Arnold	
	Telephone:	(617) 429-5920	
	Title:	Safety Director	
		Hazardous Materials	**Hazardous Substances**
2.	Volume of Hazardous Shipments (Number per year)?	30,000	Unknown, cannot be identified at present, probably small number
	Describe typical packaging and Shipment size:	Mostly packaged, some drums (up to 55 gallons)	
3.	Special Staff for Hazardous Shipments		
	-Number of Persons -Professional -Clerical -Part Time/Full Time	2 full time professionals at headquarters All terminal supervisors (53) and office managers have responsibilities for safety.	
	-Training -Time -Cost -Type -Frequency	2000 employees receive about 2 hours of safety training per year which costs about $100,000. Consultants and manuals cost a few thousand dollars per year.	

	Hazardous Materials	Hazardous Substances
4. Incremental Cost of Handling Hazardous Materials including paperwork, operating procedures, etc.: Does this depend on the type of hazardous material? -bu k vs packaged?	When a hazardous shipment is picked up, the driver must examine the paperwork and telephone his company to verify that the shipment is acceptable. This takes about 5 minutes and costs about $2.10. (This is not done for non-hazardous shipments.) The clerk who enters bill of lading data into St. Johnsbury's computer spends about one extra minute on hazardous shipments, which costs about 17¢. About 1.5% of the shipments accepted have errors which cost about $10 to correct, for a weighted cost of 15¢ per shipment. These costs do not vary by shipment type nor do they apply to non-DOT regulated substances.	
5. Insurance Costs Associated with Hazardous Shipments -Type -Cost -Costs affected by designation of additional substances	St. Johnsbury is self insured to $1 million and forsees no change as a result of additional hazardous substance designations.	
6. General Comments about Incremental Costs of Regulation, Especially ORME	Main problems have to do with inadequately trained personnel (state troopers) and small shippers' inability to do paperwork properly. Uniform regulations from state to state would help. Make about 50 calls per year to Chemtrec for advice, mostly trying to determine proper shipping name.	

	Hazardous Materials	Hazardous Substances
7. What has happened as a result of the Clean Water Act?	Very little effect. Fuel spills must be cleaned up.	
8. What would happen if all CERCLA substances were added to Haz. Mats. list by MTB?	Additional costs as described in #4.	
9. Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have already been made as a result of CERCLA, especially new instructions to your personnel?	Very little effect. Personnel simply instructed to teeat hazardous substance spills same as hazardous materials.	
10. What kinds of actions are now being undertaken to prevent spills? Would these change or expand if more substances were added to the Haz. Mats. list? Give possible examples (e.g. special training, special handling (prerouting) advance notice of shipment.)	Nothing extremely hazardous carried. Usual training for personnel (see DOT/MTB manuals).	

	Hazardous Materials	Hazardous Substances
11. What actions have you taken in cleaning up actual spills? Would these change if additional substances were added to the Haz. Mats. list? What are the costs? Whom do you call in case of a spill? Who contacts the NRC? Please describe actual experiences in past year.	St. Johnsbury averages 2-3 fuel spills per year and 2-3 chemical spills. These cost $1K to $2K each to clean up. Leaking (corroded) drums are the most common cause, followed by damage in handling. Most defective containers or packaging come from small shippers who often attempt to recycling them too many times. All spills are reported to NRC by operating personnel.	
12. How does RQ size affect your actions? How do you decide if the spill is reportable?	RQ does not affect actions at all; report all spills.	
13. Can you give us names of shippers to interview?		

	Hazardous Materials	Hazardous Substances
14. Please list the materials and substances you ship (or classes . If too many substances)		

INTERVIEW FORM FOR CARRIERS

1.	**Company Name:**	Strachan Shipping Co.	
	Address:	2640 Canal Street New Orleans, LA 70119	
	Respondent Name:	John Faulk	
	Telephone:	(504) 827-8782	
	Title:	Safety Director	
		Hazardous Materials	**Hazardous Substances**
2.	**Volume of Hazardous Shipments (Number per year)? Describe typical packaging and Shipment size:**	100-200 sailings per year 5-10 hazardous items per sailing about 1200 hazardous shipments per year	Very few, if any, hazardous substances designated by CERCLA
3.	**Special Staff for Hazardous Shipments**	See attachment	
	-Number of Persons		
	-Professional		
	-Clerical	Approximately 10% of the time of all personnel concerned with moving cargo of any type is taken up by hazardous shipments. Hazardous shipments require about 10% more time to handle than similar shipments of non-hazardous cargo.	
	-Part Time/Full Time		
	-Training		
	-Time		
	-Cost		
	-Type		
	-Frequency		

		Hazardous Materials	Hazardous Substances
4.	Incremental Cost of Handling Hazardous Materials including paperwork, operating procedures, etc.:	4 to 8 hours per sailing for checking paperwork, extra precautions in loading (see attachment 2) etc. For dangerous items, the Safety Director briefs the master of the vessel, often spending one to two hours discussing storage and emergency procedures.	
	Does this depend on the type of hazardous material? -bulk vs packaged?	Inadequate packagings, especially leaking drums, are the major cause of unnecessary expenses.	
5.	Insurance Costs Associated with Hazardous Shipments -Type -Cost -Costs affected by designation of additional substances	$5K deductible, very little or no effect resulting from designation of additional substances.	
6.	General Comments about Incremental Costs of Regulation, Especially ORME	Simplification, especially unification of various DOT, IMCO, EPA, etc. labelling and coding requirements, would save money.	

	Hazardous Materials	Hazardous Substances
7. What has happened as a result of the Clean Water Act?	Increased cost for spill clean up	
8. What would happen if all CERCLA substances were added to Haz. Mats. list by MTB?	No effect	
9. Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have already been made as a result of CERCLA, especially new instructions to your personnel?	Not aware of CERCLA. Could be handling some CERCLA-designated substances now, but probably not. Steamship Association will eventually notify companies like Strachan of new regulations. Several times in past Strachan has not been aware of new regulation until cited for violation by Coast Guard.	
10. What kinds of actions are now being undertaken to prevent spills? Would these change or expand if more substances were added to the Haz. Mats. list? Give possible examples (e.g. special training, special handling (prerouting) advance notice of shipment.)	See attachment 2.	

	Hazardous Materials	Hazardous Substances
11. What actions have you taken in cleaning up actual spills? Would these change if additional substances were added to the Haz. Mats. list? What are the costs? Whom do you call in case of a spill? Who contacts the NRC? Please describe actual experiences in past year.	Contain spill until contractor arrives if large spill; clean up small spills with absorbent and neutralize if necessary. No change as result of CERCLA. If spill occurs, call state police and Coast Guard. State police usually make decision as to whether to notify NRC. (Louisiana State Police have officers especially trained for hazardous materials emergencies; these officers praised by all persons interviewed in Louisiana)	
12. How does RQ size affect your actions? How do you decide if the spill is reportable?	See above.	
13. Can you give us names of shippers to interview?		

	Hazardous Materials	Hazardous Substances
14. Please list the materials and substances you ship (or classes if too many substances)	Insecticides (especially parathion) Methyl Bromide (a fumigant) Tetraethyl lead in 150 tank-tainers Tolune many others	

INTERVIEW FORM FOR CARRIERS

1.	**Company Name:**	United Parcel Service
	Address:	Greenwich Office Park, Bldg. #5 Greenwich, CT 06830
	Respondent Name:	Ron Hinkle
	Telephone:	(203) 622-6008
	Title:	Manager, Hazardous Materials

		Hazardous Materials	**Hazardous Substances**
2.	**Volume of Hazardous Shipments (Number per year)?**	About 20K/day	Unknown, small, many not handled by UPS or RQ's ≥ 70 lb
	Describe typical packaging and Shipment size:	Out of 6 million total	

3. **Special Staff for Hazardous Shipments**

-Number of Persons
    -Professional
    -Clerical
    -Part Time/Full Time
-Training
    -Time
    -Cost
    -Type
    -Frequency

1 full time
1 part time consultant (Phd)

800 service representatives trained to advise customers and deal with spills. 65K drivers trained to recognize which packages acceptable. All employees handling packages tested once per year on knowledge of regulations (probably about 4 hrs. per year for 80K employees) or about $5.8 million per year.

$8 each for 20,000 copies of manual ($160K total) revised about once a year.

		Hazardous Materials	Hazardous Substances
4.	Incremental Cost of Handling Hazardous Materials including paper-work, operating procedures, etc.)	Approximately 30 seconds for drivers to examine each package, 120 hours per day @ $10 per hour for auditing all of UPS follow-up cost significant -	
	Does this depend on the type of hazardous material? -bulk vs packaged?	No surcharge for hazardous materials.	
5.	Insurance Costs Associated with Hazardous Shipments -Type -Cost -Costs affected by designation of additional substances	No effect.	
6.	General Comments about Incremental Costs of Regulation, Especially ORME	Increased packaging costs for some chemicals for which UPS requires poison pack. (see attachment)	

		Hazardous Materials	Hazardous Substances
7.	What has happened as a result of the Clean Water Act?	Nothing except in fixed facilities.	
8.	What would happen if all CERCLA substances were added to Haz. Mats. list by MTB?	Only incremental costs of paperwork. Does not affect decision as to whether to accept them.	
9.	Are you aware of CERCLA? What substances of concern to you are affected by CERCLA? What changes have already been made as a result of CERCLA, especially new instructions to your personnel?	New edition of manual, but would probably change manual anyway. UPS will provide classifications based on list of ingredients (about 250 requests per year, costs $10K per year or $40 per determination by PhD).	
10.	What kinds of actions are now being undertaken to prevent spills? Would these change or expand if more substances were added to the Haz. Mats. list? Give possible examples: (e.g. special training, special handling (prerouting) advance notice of shipment.)	Biggest problem is leaking bottle caps. Encourage use of seals, shrink wrap to prevent loosening. Extensive packing requirements as detailed in manual. (see attachment)	

	Hazardous Materials	Hazardous Substances
11. What actions have you taken in cleaning up actual spills? Would these change if additional substances were added to the Haz. Mats. list? What are the costs? Whom do you call in case of a spill? Who contacts the NRC? Please describe actual experiences in past year.	Only one call so far this year out of 123 incidents. Most incidents are leaking bottle caps with much less than 1 pound spilled. Depends on spill; most very small - significant cost only if building must be evacuated i.e. pyradine, formaldehyde.	
12. How does RQ size affect your actions? How do you decide if the spill is reportable?	Terminal employees report to headquarters (Chemtrec after hours) HQ will call NRC only if necessary. Look up RQ in manual, call NRC only if RQ spilled. Usually easy to tell spill size since it is contained within the package.	
13. Can you give us names of shippers to interview?		

	Hazardous Materials	Hazardous Substances
14. Please list the materials and substances you ship (or classes. If too many substances)	All except Class I explosives, Class 7 Radioactives, Class 6 Poisons and Irritants, Class 4 Water-Reactives and Etiologic Agents. No hazardous materials handled by air.	

APPENDIX C

TABULATION OF CERCLA LISTED SUBSTANCES

"RCRA Waste Number" column provides the waste identification numbers assigned to various substances by RCRA regulations. The column headed "Category" lists the code letters "X," "A," "B," "C," and "D," which are associated with reportable quantities of 1, 10, 100, 1000, and 5000 pounds, respectively. The "Pounds (kg)" column provides the reportable quantity for each hazardous substance in pounds and kilograms.

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES

	Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
				RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
	Acenaphthene	83329		1*	2		X	1~~00~~ (0.454)
	Acenaphthylene	208968		1*	2		X	1~~00~~ (0.454)
*	Acetaldehyde	75070	Ethanal	1000	1,4	U001	C	1000 (454)
	Acetaldehyde, chloro-	107200	Chloroacetaldehyde	1*	4	P023	C	1000 (454)
	Acetaldehyde, trichloro-	75876	Chloral	1*	4	U034	X	1~~0~~(0.454)
	Acetamide, N-(aminothioxomethyl)-	591082	1-Acetyl-2-thiourea	1*	4	P002	C	1000 (454)
	Acetamide, N-(4-ethoxyphenyl)-	62442	Phenacetin	1*	4	U187	X	1~~0~~ (0.454)
	Acetamide, N-9H-fluoren-2-yl-	53963	2-Acetylaminofluorene	1*	4	U005	X	1~~0~~ (0.454)
	Acetamide, 2-fluoro-	640197	Fluoroacetamide	1*	4	P057	B	100(45.4)
*	Acetic acid	64197		1000	1		D	5000 (2270)
*	Acetic acid, ethyl ester	141786	Ethyl acetate	1*	4	U112	D	5000 (2270)
	Acetic acid, fluoro-, sodium salt	62748	Fluoroacetic acid, sodium salt	1*	4	P058	A	10 (4.54)
**	Acetic acid, lead salt	301042	Lead acetate	5000	1,4	U144	D	5000~~0~~ (2270)
*	Acetic acid, thallium(I) salt	563688	Thallium(I) acetate	1*	4	U214	X	1~~00~~ (0.454)
*	Acetic anhydride	108247		1000	1		D	5000 (2270)
	Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester.	16752775	Methomyl	1*	4	P066	B	100 (45.4)
*	Acetone	67641	2-Propanone	1*	4	U002	D	5000 (2270)
*	Acetone cyanohydrin	75865	2-Methyllactonitrile Propanenitrile, 2-hydroxy-2-methyl-	10	1,4	P069	A	10 (4.54)
*	Acetonitrile	75058	Ethanenitrile	1*	4	U003	D	5000 (2270)
	3-(alpha-Acetonylbenzyl)- 4-hydroxycoumarin and salts	81812	Warfarin	1*	4	P001	B	100 (45.4)
	Acetophenone	98862	Ethanone, 1-phenyl-	1*	4	U004	D	5000 (2270)
	2-Acetylaminofluorene	53963	Acetamide, N-9H-fluoren-2-yl-	1*	4	U005	X	1~~0~~ (0.454)
*	Acetyl bromide	506967		5000	1		D	5000 (2270)
*	Acetyl chloride	75365	Ethanoyl chloride	5000	1,4	U006	D	5000 (2270)
	1-Acetyl-2-thiourea	591082	Acetamide, N-(aminothioxomethyl)-	1*	4	P002	C	1000 (454)
*	Acrolein	107028	2-Propenal	1	1,2,4	P003	X	1 (0.454)
	Acrylamide	79061	2-Propenamide	1*	4	U007	D	5000 (2270)
*	Acrylic acid	79107	2-Propenoic acid	1*	4	U008	D	5000 (2270)
*	Acrylonitrile	107131	2-Propenenitrile	100	1,2,4	U009	B	100~~0~~ (45.4)
**	Adipic acid	124049		5000	1		D	5000 (2270)
	Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-,L-	148823	Melphalan	1*	4	U150	X	1~~0~~ (0.454)
	Aldicarb	116063	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime.	1*	4	P070	X	1 (0.454)
*	Aldrin	309002	1,2,3,4,10-10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo, exo- dimethanonaphthalene.	1	1,2,4	P004	X	1~~0~~ (0.454)
*	Allyl alcohol	107186	2-Propen-1-ol	100	1,4	P005	B	100 (45.4)
*	Allyl chloride	107051		1000	1		C	1000 (454)
*	Aluminum phosphide	20859738		1*	4	P006	B	100 (45.4)
**	Aluminum sulfate	10043013		5000	1		D	5000 (2270)
	5-(Aminomethyl)-3-isoxazolol	2763964	3(2H)-Isoxazolone, 5-(aminomethyl)-	1*	4	P007	C	1000 (454)
	4-Aminopyridine	504245	4-Pyridinamine	1*	4	P008	C	1000 (454)

* the substance has a DOT hazardous material s number.

** the substance meets criteria for a hazardous material but does not have a number assigned.

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Amitrole	61825	1H-1,2,4-Triazol-3-amine	1*	4	U011	X	1# (0.454)
* Ammonia	7664417		100	1		B	100## (45.4)
** Ammonium acetate	631618		5000	1		D	5000 (2270)
** Ammonium benzoate	1863634		5000	1		D	5000 (2270)
** Ammonium bicarbonate	1066337		5000	1		D	5000 (2270)
* Ammonium bichromate	7789095		1000	1		C	1000# (454)
* Ammonium bifluoride	1341497		5000	1		D	5000## (2270)
** Ammonium bisulfite	10192300		5000	1		D	5000 (2270)
** Ammonium carbamate	1111780		5000	1		D	5000 (2270)
** Ammonium carbonate	506876		5000	1		D	5000 (2270)
** Ammonium chloride	12125029		5000	1		D	5000 (2270)
** Ammonium chromate	7788989		1000	1		C	1000# (454)
** Ammonium citrate, dibasic	3012655		5000	1		D	5000 (2270)
** Ammonium fluoborate	13826830		5000	1		D	5000 (2270)
* Ammonium fluoride	12125018		5000	1		B	100 (45.4)
* Ammonium hydroxide	1336216		1000	1		C	1000 (454)
** Ammonium oxalate	6009707 5972736 14258492		5000	1		D	5000 (2270)
* Ammonium picrate	131748	Phenol, 2,4,6-trinitro-, ammonium salt	1*	4	P009	A	10 (4.54)
** Ammonium silicofluoride	16919190		1000	1		C	1000 (454)
** Ammonium sulfamate	7773060		5000	1		D	5000 (2270)
* Ammonium sulfide	12135761		5000	1		B	100 (45.4)
** Ammonium sulfite	10196040		5000	1		D	5000 (2270)
** Ammonium tartrate	14307438 3164292		5000	1		D	5000 (2270)
** Ammonium thiocyanate	1762954		5000	1		D	5000 (2270)
** Ammonium thiosulfate	7783188		5000	1		D	5000 (2270)
Ammonium vanadate	7803556	Vanadic acid, ammonium salt	1*	4	P119	C	1000 (454)
* Amyl acetate iso- sec- tert-	628637 123922 626380 625161		1000	1		D	5000 (2270)
* Aniline	62533	Benzenamine	1000	1,4	U012	D	5000 (2270)
Anthracene	120127		1*	2		X	1## (0.454)
Antimony ††	7440360		1*	2		X	1## (0.454)
ANTIMONY AND COMPOUNDS			1*	2			**
* Antimony pentachloride	7647189		1000	1		C	1000 (454)
* Antimony potassium tartrate	28300745		1000	1		B	100 (45.4)
** Antimony tribromide	7789619		1000	1		C	1000 (454)
* Antimony trichloride	10025919		1000	1		C	1000(454)
** Antimony trifluoride	7783564		1000	1		C	1000 (454)
** Antimony trioxide	1309644		5000	1		C	1000 (454)
* Aroclor 1016	12674112	Polychlorinated Biphenyls (PCBs)	10	1,2		A	10# (4.54)
* Aroclor 1221	11104282	Polychlorinated Biphenyls (PCBs)	10	1,2		A	10# (4.54)
* Aroclor 1232	11141165	Polychlorinated Biphenyls (PCBs)	10	1,2		A	10# (4.54)
* Aroclor 1242	53469219	PolychlorinatedBiphenyls (PCBs)	10	1,2		A	10# (4.54)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
# Aroclor 1248	12672296	Polychlorinated Biphenyls (PCBs)	10	1,2		A	10# (4.54)
# Aroclor 1254	11097691	Polychlorinated Biphenyls (PCBs)	10	1,2		A	10# (4.54)
# Aroclor 1260	11096825	Polychlorinated Biphenyls (PCBs)	10	1,2		A	10# (4.54)
# Arsenic ‡‡	7440382		1*	2,3		X	1#(0.454)
# Arsenic acid	1327522 7778394		1*	4	P010	X	1# (0.454)
# ARSENIC AND COMPOUNDS			1*	2			**
# Arsenic disulfide	1303328		5000	1		D	5000# (2270)
# Arsenic(III) oxide	1327533	Arsenic trioxide	5000	1,4	P012	D	5000# (2270)
# Arsenic(V) oxide	1303282	Arsenic pentoxide	5000	1,4	P011	D	5000#(2270)
# Arsenic pentoxide	1303282	Arsenic(V) oxide	5000	1,4	P011	D	5000# (2270)
# Arsenic trichloride	7784341		5000	1		D	5000# (2270)
# Arsenic trioxide	1327533	Arsenic(III) oxide	5000	1,4	P012	D	5000# (2270)
# Arsenic trisulfide	1303339		5000	1		D	5000# (2270)
Arsine, diethyl-	692422	Diethylarsine	1*	4	P038	X	1# (0.454)
# Asbestos ‡‡‡	1332214		1*	2,3		X	1# (0.454)
Auramine	492808	Benzenamine, 4,4'-carbonimidoylbis(N,N-dimethyl-	1*	4	U014	X	1# (0.454)
Azaserine	115026	L-Serine, diazoacetate (ester)	1*	4	U015	X	1# (0.454)
# Aziridine	151564	Ethylenimine	1*	4	P054	X	1# (0.454)
Azirino(2',3':3,4)pyrrolo(1,2-a)indole-4,7-dione,6-amino-8-[((aminocarbonyl)oxy)methyl]- 1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-	50077	Mitomycin C	1*	4	U010	X	1# (0.454)
# Barium cyanide	542621		10	1,4	P013	A	10 (4.54)
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	56495	3-Methylcholanthrene	1*	4	U157	X	1# (0.454)
Benz[c]acridine	225514	3,4-Benzacridine	1*	4	U016	X	1# (0.454)
3,4-Benzacridine	225514	Benz[c]acridine	1*	4	U016	X	1# (0.454)
Benzal chloride	98873	Benzene, dichloromethyl-	1*	4	U017	D	5000 (2270)
Benz[a]anthracene	56553	1,2-Benzanthracene Benzo[a]anthracene	1*	2,4	U018	X	1# (0.454)
1,2-Benzanthracene	56553	Benz[a]anthracene Benzo[a]anthracene	1*	2,4	U018	X	1# (0.454)
1,2-Benzanthracene, 7,12-dimethyl-	57976	7,12-Dimethylbenz[a]anthracene	1*	4	U094	X	1# (0.454)
# Benzenamine	62533	Aniline	1000	1,4	U012	D	5000 (2270)
Benzenamine, 4,4'-carbonimidoylbis(N,N-dimethyl-	492808	Auramine	1*	4	U014	X	1# (0.454)
Benzenamine, 4-chloro-	106478	p-Chloroaniline	1*	4	P024	C	1000 (454)
# Benzenamine, 4-chloro-2-methyl-,hydrochloride	3165933	4-Chloro-o-toluidine, hydrochloride	1*	4	U049	X	1# (0.454)
Benzenamine, N,N-dimethyl-4-phenylazo-	60117	Dimethylaminoazobenzene	1*	4	U093	X	1# (0.454)
Benzenamine, 4,4'-methylenebis(2-chloro-	101144	4,4'-Methylenebis(2-chloroaniline)	1*	4	U158	X	1# (0.454)
Benzenamine, 2-methyl-, hydrochloride	636215	o-Toluidine hydrochloride	1*	4	U222	X	1# (0.454)
Benzenamine, 2-methyl-5-nitro-	99558	5-Nitro-o-toluidine	1*	4	U181	X	1# (0.454)
# Benzenamine, 4-nitro-	100016	p-Nitroaniline	1*	4	P077	D	5000 (2270)
# Benzene	71432		1000	1,2,3,4	U019	C	1000# (454)
Benzene, 1-bromo-4-phenoxy-	101553	4-Bromophenyl phenyl ether	1*	2,4	U030	B	100 (45.4)
# Benzene, chloro-	108907	Chlorobenzene	100	1,2,4	U037	B	100 (45.4)
# Benzene, chloromethyl-	100447	Benzyl chloride	100	1,4	P028	B	100# (45.4)
# Benzene, 1,2-dichloro-	95501	1,2-Dichlorobenzene o-Dichlorobenzene	100	1,2,4	U070	B	100 (45.4)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Benzene, 1,3-dichloro-	541731	1,3-Dichlorobenzene m-Dichlorobenzene	1*	2,4	U071	B	100 (45.4)
* Benzene, 1,4-dichloro-	106467	1,4-Dichlorobenzene p-Dichlorobenzene	100	1,2,4	U072	B	100 (45.4)
Benzene, dichloromethyl-	98873	Benzal chloride	1*	4	U017	D	5000 (2270)
* Benzene, 2,4-diisocyanatomethyl-	584849 91087 26471625	Toluene diisocyanate	1*	4	U223	B	100 (45.4)
* Benzene, dimethyl m- o- p-	1330207 108383 95476 106423	Xylene m- o- p-	1000	1,4	U239	C	1000 (454)
Benzene, hexachloro-	118741	Hexachlorobenzene	1*	2,4	U127	X	1# (0.454)
* Benzene, hexahydro-	110827	Cyclohexane	1000	1,4	U056	C	1000 (454)
Benzene, hydroxy-	108952	Phenol	1000	1,2,4	U188	C	1000## (454)
* Benzene, methyl-	108883	Toluene	1000	1,2,4	U220	C	1000 (454)
Benzene, 1-methyl-2,4-dinitro-	121142	2,4-Dinitrotoluene	1000	1,2,4	U105	C	1000# (454)
Benzene, 1-methyl-2,6-dinitro-	606202	2,6-Dinitrotoluene	1000	1,2,4	U106	C	1000# (454)
Benzene, 1,2-methylenedioxy-4-allyl-	94597	Safrole	1*	4	U203	X	1# (0.454)
Benzene, 1,2-methylenedioxy-4-propenyl-	120581	Isosafrole	1*	4	U141	X	1# (0.454)
Benzene, 1,2-methylenedioxy-4-propyl-	94586	Dihydrosafrole	1*	4	U090	X	1# (0.454)
Benzene, 1-methylethyl-	98828	Cumene	1*	4	U055	D	5000 (2270)
* Benzene, nitro-	98953	Nitrobenzene	1000	1,2,4	U169	C	1000 (454)
Benzene, pentachloro-	608935	Pentachlorobenzene	1*	4	U183	X	1## (0.454)
Benzene, pentachloronitro-	82688	Pentachloronitrobenzene	1*	4	U185	X	1# (0.454)
Benzene, 1,2,4,5-tetrachloro-	95943	1,2,4,5-Tetrachlorobenzene	1*	4	U207	D	5000 (2270)
Benzene, trichloromethyl-	98077	Benzotrichloride	1*	4	U023	X	1# (0.454)
* Benzene, 1,3,5-trinitro-	99354	sym-Trinitrobenzene	1*	4	U234	X	1## (0.454)
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510156	Ethyl 4,4'-dichlorobenzilate	1*	4	U038	X	1# (0.454)
1,2-Benzenedicarboxylic acid anhydride	85449	Phthalic anhydride	1*	4	U190	D	5000 (2270)
1,2-Benzenedicarboxylic acid,[bis(2-ethylhexyl)] ester	117817	Bis(2-ethylhexyl)phthalate	1*	2,4	U028	X	1# (0.454)
** 1,2-Benzenedicarboxylic acid,dibutyl ester	84742	n-Butyl phthalate Dibutyl phthalate Di-n-butyl phthalate	100	1,2,4	U069	A	10 (4.54)
1,2-Benzenedicarboxylic acid,diethyl ester	84662	Diethyl phthalate	1*	2,4	U088	C	1000 (454)
1,2-Benzenedicarboxylic acid,dimethyl ester	131113	Dimethyl phthalate	1*	2,4	U102	D	5000 (2270)
1,2-Benzenedicarboxylic acid,di-n-octyl ester	117840	Di-n-octyl phthalate	1*	2,4	U107	D	5000 (2270)
** 1,3-Benzenediol	108463	Resorcinol	1000	1,4	U201	D	5000 (2270)
1,2-Benzenediol,4-[1-hydroxy-2-(methylamino)ethyl]-	51434	Epinephrine	1*	4	P042	C	1000 (454)
Benzenesulfonic acid chloride	98099	Benzenesulfonyl chloride	1*	4	U020	B	100 (45.4)
Benzenesulfonyl chloride	98099	Benzenesulfonic acid chloride	1*	4	U020	B	100 (45.4)
Benzenethiol	108985	Thiophenol	1*	4	P014	B	100 (45.4)
Benzidine	92875	(1,1'-Biphenyl)-4,4'diamine	1*	2,4	U021	X	1# (0.454)
1,2-Benzisothiazolin-3-one,1,1-dioxide, and salts	81072	Saccharin and salts	1*	4	U202	X	1# (0.454)
Benzo[a]anthracene	56553	Benz[a]anthracene 1,2-Benzanthracene	1*	2,4	U018	X	1# (0.454)
Benzo[b]fluoranthene	205992		1*	2		X	1# (0.454)
Benzo(k)fluoranthene	207089		1*	2		X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Benzo[j,k]fluorene	206440	Fluoranthene	1*	2,4	U120	X	1## (0.454)
** Benzoic acid	65850		5000	1		D	5000 (2270)
** Benzonitrile	100470		1000	1		D	5000 (2270)
Benzo[ghi]perylene	191242		1*	2		X	1## (0.454)
Benzo[a]pyrene	50328	3,4-Benzopyrene	1*	2,4	U022	X	1# (0.454)
3,4-Benzopyrene	50328	Benzo[a]pyrene	1*	2,4	U022	X	1# (0.454)
p-Benzoquinone	106514	1,4-Cyclohexadienedione	1*	4	U197	X	1## (0.454)
Benzotrichloride	98077	Benzene, trichloromethyl-	1*	4	U023	X	1# (0.454)
* Benzoyl chloride	98884		1000	1		C	1000 (454)
* 1,2-Benzphenanthrene	218019	Chrysene	1*	2,4	U050	X	1# (0.454)
* Benzyl chloride	100447	Benzene, chloromethyl-	100	1,4	P028	B	100# (45.4)
Beryllium ††	7440417	Beryllium dust	1*	2,3,4	P015	X	1# (0.454)
* BERYLLIUM AND COMPOUNDS			1*	2			**
** Beryllium chloride	7787475		5000	1		D	5000# (2270)
Beryllium dust	7440417	Beryllium	1*	2,3,4	P015	X	1# (0.454)
** Beryllium fluoride	7787497		5000	1		D	5000# (2270)
** Beryllium nitrate	13597994 7787555		5000	1		D	5000# (2270)
alpha - BHC	319846		1*	2		X	1# (0.454)
beta - BHC	319857		1*	2		X	1# (0.454)
* gamma - BHC	58899	Hexachlorocyclohexane (gamma isomer) Lindane	1	1,2,4	U129	X	1# (0.454)
delta - BHC	319868		1*	2		X	1## (0.454)
2,2'-Bioxirane	1464535	1,2:3,4-Diepoxybutane	1*	4	U085	X	1# (0.454)
(1,1'-Biphenyl)-4,4'diamine	92875	Benzidine	1*	2,4	U021	X	1# (0.454)
(1,1'-Biphenyl)-4,4'diamine,3,3'dichloro-	91941	3,3'-Dichlorobenzidine	1*	2,4	U073	X	1# (0.454)
(1,1'-Biphenyl)-4,4'diamine,3,3'dimethoxy-	119904	3,3'-Dimethoxybenzidine	1*	4	U091	X	1# (0.454)
(1,1'Biphenyl)-4,4'-diamine,3,3'-dimethyl-	119937	3,3'-Dimethylbenzidine	1*	4	U095	X	1# (0.454)
Bis(2-chloroethoxy) methane	111911	Ethane, 1,1'-[methylenebis(oxy)]bis(2-chloro-	1*	2,4	U024	C	1000 (454)
Bis (2-chloroethyl) ether	111444	Dichloroethyl ether Ethane, 1,1'-oxybis[2-chloro-	1*	2,4	U025	X	1# (0.454)
Bis(2-chloroisopropyl) ether	108601	Propane, 2,2'-oxybis(2-chloro-	1*	2,4	U027	C	1000 (454)
Bis(chloromethyl) ether	542881	Methane, oxybis(chloro-	1*	4	P016	X	1# (0.454)
* Bis(dimethylthiocarbamoyl) disulfide	137268	Thiram	1*	4	U244	A	10 (4.54)
Bis(2-ethylhexyl)phthalate	117817	1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester	1*	2,4	U028	X	1# (0.454)
* Bromine cyanide	506683	Cyanogen bromide	1*	4	U246	C	1000 (454)
* Bromoacetone	598312	2-Propanone, 1-bromo-	1*	4	P017	C	1000 (454)
Bromoform	75252	Methane, tribromo-	1*	2,4	U225	B	100 (45.4)
4-Bromophenyl phenyl ether	101553	Benzene, 1-bromo-4-phenoxy-	1*	2,4	U030	B	100 (45.4)
* Brucine	357573	Strychnidin-10-one, 2,3-dimethoxy-	1*	4	P018	B	100 (45.4)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87683	Hexachlorobutadiene	1*	2,4	U128	X	1# (0.454)
1-Butanamine, N-butyl-N-nitroso-	924163	N-Nitrosodi-n-butylamine	1*	4	U172	X	1# (0.454)
Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene	305033	Chlorambucil	1*	4	U035	X	1# (0.454)
1-Butanol	71363	n-Butyl alcohol	1*	4	U031	D	5000 (2270)
* 2-Butanone	78933	Methyl ethyl ketone	1*	4	U159	D	5000 (2270)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
2-Butanone peroxide	1338234	Methyl ethyl ketone peroxide	1*	4	U160	A	10 (4.54)
* 2-Butenal	123739 4170303	Crotonaldehyde	100	1,4	U053	B	100 (45.4)
* 2-Butene, 1,4-dichloro-	764410	1,4-Dichloro-2-butene	1*	4	U074	X	1 (0.454)
* Butyl acetate	123864		5000	1		D	5000 (2270)
* iso-	110190						
** sec-	105464						
** tert-	540885						
n-Butyl alcohol	71363	1-Butanol	1*	4	U031	D	5000 (2270)
* Butylamine	109739		1000	1		C	1000 (454)
** iso-	78819						
** sec-	513495						
** sec-	13952846						
** tert-	75649						
Butyl benzyl phthalate	85687		1*	2		B	100 (45.4)
n-Butyl phthalate	84742	1,2-Benzenedicarboxylic acid,dibutyl ester Dibutyl phthalate Di-n-butyl phthalate	100	1,2,4	U069	A	10 (4.54)
* Butyric acid	107926		5000	1		D	5000 (2270)
iso-	79312						
* Cacodylic acid	75605	Hydroxydimethylarsine oxide	1*	4	U136	X	1# (0.454)
Cadmium ††	7440439		1*	2		X	1# (0.454)
** Cadmium acetate	543908		100	1		B	100# (45.4)
CADMIUM AND COMPOUNDS			1*	2			**
** Cadmium bromide	7789426		100	1		B	100# (45.4)
** Cadmium chloride	10108642		100	1		B	100# (45.4)
* Calcium arsenate	7778441		1000	1		C	1000# (454)
* Calcium arsenite	52740166		1000	1		C	1000# (454)
* Calcium carbide	75207		5000	1		A	10 (4.54)
* Calcium chromate	13765190	Chromic acid, calcium salt	1000	1,4	U032	C	1000# (454)
* Calcium cyanide	592018		10	1,4	P021	A	10 (4.54)
** Calcium dodecylbenzene sulfonate	26264062		1000	1		C	1000 (454)
* Calcium hypochlorite	7778543		100	1		A	10(4.54)
** Camphene, octachloro-	8001352	Toxaphene	1	1,2,4	P123	X	1# (0.454)
** Captan	133062		10	1		A	10## (4.54)
Carbamic acid, ethyl ester	51796	Ethyl carbamate (Urethan)	1*	4	U238	X	1# (0.454)
Carbamic acid, methylnitroso-,ethyl ester	615532	N-Nitroso-N-methylurethane	1*	4	U178	X	1# (0.454)
Carbamide, N-ethyl-N-nitroso-	759739	N-Nitroso-N-ethylurea	1*	4	U176	X	1# (0.454)
Carbamide, N-methyl-N-nitroso-	684935	N-Nitroso-N-methylurea	1*	4	U177	X	1# (0.454)
Carbamide, thio-	62566	Thiourea	1*	4	U219	X	1# (0.454)
Carbamimidoselenoic acid	630104	Selenourea	1*	4	P103	X	1## (0.454)
Carbamoyl chloride, dimethyl-	79447	Dimethylcarbamoyl chloride	1*	4	U097	X	1# (0.454)
* Carbaryl	63252		100	1		B	100 (45.4)
** Carbofuran	1563662		10	1		A	10 (4.54)
* Carbon bisulfide	75150	Carbon disulfide	5000	1,4	P022	D	5000## (2270)
* Carbon disulfide	75150	Carbon bisulfide	5000	1,4	P022	D	5000## (2270)
* Carbonic acid, dithallium (I) salt	6533739	Thallium(I) carbonate	1*	4	U215	X	1## (0.454)
Carbonochloridic acid, methyl ester	79221	Methyl chlorocarbonate	1*	4	U156	C	1000 (454)
Carbon oxyfluoride	353504	Carbonyl fluoride	1*	4	U033	C	1000 (454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
# Carbon tetrachloride	56235	Methane, tetrachloro-	5000	1,2,4	U211	D	5000# (2270)
# Carbonyl chloride	75445	Phosgene	5000	1,4	P095	A	10 (4.54)
Carbonyl fluoride	353504	Carbon oxyfluoride	1*	4	U033	C	1000 (454)
Chloral	75876	Acetaldehyde, trichloro-	1*	4	U034	X	1#(0.454)
Chlorambucil	305033	Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene-	1*	4	U035	X	1# (0.454)
CHLORDANE (TECHNICAL MIXTURE AND METABOLITES)			1*	2			**
# Chlordane	57749	Chlordane, technical 4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro- 3a,4,7,7a-tetrahydro-	1	1,2,4	U036	X	1# (0.454)
# Chlordane, technical	57749	Chlordane 4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro- 3a,4,7,7a-tetrahydro-	1	1,2,4	U036	X	1# (0.454)
CHLORINATED BENZENES			1*	2			**
CHLORINATED ETHANES			1*	2			**
CHLORINATED NAPHTHALENE			1*	2			**
CHLORINATED PHENOLS			1*	2			**
# Chlorine	7782505		10	1		A	10 (4.54)
# # Chlorine cyanide	506774	Cyanogen chloride	10	1,4	P033	A	10 (4.54)
Chlornaphazine	494031	2-Naphthylamine, N,N-bis(2-chloroethyl)-	1*	4	U026	X	1# (0.454)
Chloroacetaldehyde	107200	Acetaldehyde, chloro-	1*	4	P023	C	1000 (454)
CHLOROALKYL ETHERS			1*	2			**
p-Chloroaniline	106478	Benzenamine, 4-chloro-	1*	4	P024	C	1000 (454)
# Chlorobenzene	108907	Benzene, chloro-	100	1,2,4	U037	B	100 (45.4)
4-Chloro-m-cresol	59507	p-Chloro-m-cresol Phenol, 4-chloro-3-methyl-	1*	2,4	U039	D	5000 (2270)
p-Chloro-m-cresol	59507	4-Chloro-m-cresol Phenol, 4-chloro-3-methyl-	1*	2,4	U039	D	5000 (2270)
Chlorodibromomethane	124481		1*	2		B	100 (45.4)
# # 1-Chloro-2,3-epoxypropane	106898	Epichlorohydrin Oxirane, 2-(chloromethyl)-	1000	1,4	U041	C	1000# (454)
# Chloroethane	75003		1*	2		X	1## (0.454)
2-Chloroethyl vinyl ether	110758	Ethene, 2 chloroethoxy-	1*	2,4	U042	C	1000 (454)
# Chloroform	67663	Methane, trichloro-	5000	1,2,4	U044	D	5000# (2270)
Chloromethyl methyl ether	107302	Methane, chloromethoxy-	1*	4	U046	X	1# (0.454)
beta-Chloronaphthalene	91587	2-Chloronaphthalene Naphthalene, 2-chloro-	1*	2,4	U047	D	5000 (2270)
2-Chloronaphthalene	91587	beta-Chloronaphthalene Naphthalene, 2-chloro-	1*	2,4	U047	D	5000 (2270)
2-Chlorophenol	95578	o-Chlorophenol Phenol, 2-chloro-	1*	2,4	U048	B	100 (45.4)
o-Chlorophenol	95578	2-Chlorophenol Phenol, 2-chloro-	1*	2,4	U048	B	100 (45.4)
4-Chlorophenyl phenyl ether	7005723		1*	2		D	5000 (2270)
1-(o-Chlorophenyl)thiourea	5344821	Thiourea, (2-chlorophenyl)-	1*	4	P026	B	100 (45.4)
3-Chloropropionitrile	542767	Propanenitrile, 3-chloro-	1*	4	P027	C	1000 (454)
# Chlorosulfonic acid	7790945		1000	1		C	1000 (454)
# 4-Chloro-o-toluidine, hydrochloride	3165933	Benzenamine, 4-chloro-2-methyl-, hydrochloride	1*	4	U049	X	1# (0.454)
# # Chlorpyrifos	2921882		1	1		X	1 (0.454)
# # Chromic acetate	1066304		1000	1		C	1000## (454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
* Chromic acid	11115745 7738945		1000	1		C	1000# (454)
** Chromic acid, calcium salt	13765190	Calcium chromate	1000	1,4	U032	C	1000# (454)
** Chromic sulfate	10101538		1000	1		C	1000## (454)
Chromium ††	7440473		1*	2		X	1# (0.454)
CHROMIUM AND COMPOUNDS			1*	2			**
* Chromous chloride	10049055		1000	1		C	1000## (454)
Chrysene	218019	1,2-Benzphenanthrene	1*	2,4	U050	X	1# (0.454)
* Cobaltous bromide	7789437		1000	1		C	1000(454)
* Cobaltous formate	544183		1000	1		C	1000 (454)
* Cobaltous sulfamate	14017415		1000	1		C	1000 (454)
Coke Oven Emissions	N.A.		1*	3		X	1# (0.454)
Copper ††	7440508		1*	2		X	1## (0.454)
COPPER AND COMPOUNDS			1*	2			# **
* Copper cyanide	544923		1*	4	P029	A	10 (4.54)
** Coumaphos	56724		10	1		A	10 (4.54)
* Creosote	8001589		1*	4	U051	X	1# (0.454)
** Cresol(s) m- o- p-	1319773 108394 95487 106445	Cresylic acid	1000	1,4	U052	C	1000## (454)
** Cresylic acid m- o- p-	1319773 108394 95487 106445	Cresol(s)	1000	1,4	U052	C	1000## (454)
* Crotonaldehyde	123739 4170303	2-Butenal	100	1,4	U053	B	100 (45.4)
Cumene	98828	Benzene, 1-methylethyl-	1*	4	U055	D	5000 (2270)
** Cupric acetate	142712		100	1		B	100 (45.4)
* Cupric acetoarsenite	12002038		100	1		B	100# (45.4)
* Cupric chloride	7447394		10	1		A	10## (4.54)
** Cupric nitrate	3251238		100	1		B	100 (45.4)
** Cupric oxalate	5893663		100	1		B	100 (45.4)
** Cupric sulfate	7758987		10	1		A	10## (4.54)
** Cupric sulfate ammoniated	10380297		100	1		B	100 (45.4)
** Cupric tartrate	815827		100	1		B	100## (45.4)
* CYANIDES			1*	2			**
Cyanides (soluble cyanide salts), not elsewhere specified	57125		1*	4	P030	A	10 (4.54)
* Cyanogen	460195		1*	4	P031	B	100 (45.4)
* Cyanogen bromide	506683	Bromine cyanide	1*	4	U246	C	1000 (454)
** Cyanogen chloride	506774	Chlorine cyanide	10	1,4	P033	A	10 (4.54)
1,4-Cyclohexadienedione	106514	p-Benzoquinone	1*	4	U197	X	1## (0.454)
* Cyclohexane	110827	Benzene, hexahydro-	1000	1,4	U056	C	1000(454)
Cyclohexanone	108941		1*	4	U057	D	5000 (2270)
** 1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77474	Hexachlorocyclopentadiene	1	1,2,4	U130	X	1# (0.454)
Cyclophosphamide	50180	2H-1,3,2-Oxazaphosphorine,2-[bis(2-chloroethyl)amino] tetrahydro-2-oxide	1*	4	U058	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
** 2,4-D Acid	94757	2,4-D, salts and esters 2,4-Dichlorophenoxyacetic acid, salts and esters	100	1,4	U240	B	100 (45.4)
** 2,4-D Esters	94111 94791 94804 1320189 1928387 1928616 1929733 2971382 25168267 53467111		100	1		B	100 (45.4)
** 2,4-D, salts and esters	94757	2,4-D Acid 2,4-Dichlorophenoxyacetic acid, salts and esters	100	1,4	U240	B	100 (45.4)
Daunomycin	20830813	5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy- alpha-L-lyxo- hexopyranosyl)oxy]-7,8,9,10-tetrahydro- 6,8,11-trihydroxy- 1-methoxy-.	1*	4	U059	X	1# (0.454)
** DDD	72548	4,4' DDD Dichlorodiphenyl dichloroethane TDE	1	1,2,4	U060	X	1# (0.454)
** 4,4' DDD	72548	DDD Dichlorodiphenyl dichloroethane TDE	1	1,2,4	U060	X	1# (0.454)
DDE	72559	4,4' DDE	1*	2		X	1# (0.454)
4,4' DDE	72559	DDE	1*	2		X	1# (0.454)
* DDT	50293	4,4' DDT Dichlorodiphenyl trichloroethane	1	1,2,4	U061	X	1# (0.454)
* 4,4'DDT	50293	DDT Dichlorodiphenyl trichloroethane	1	1,2,4	U061	X	1# (0.454)
DDT AND METABOLITES			1*	2			**
** Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta[c,d]-pentalen-2-one.	143500	Kepone	1	1,4	U142	X	1# (0.454)
Diallate	2303164	S-(2,3-Dichloroallyl) diisopropylthiocarbamate	1*	4	U062	X	1# (0.454)
* Diamine	302012	Hydrazine	1*	4	U133	X	1# (0.454)
* Diaminotoluene	95807 25376458 496720 823405	Toluenediamine	1*	4	U221	X	1# (0.454)
* Diazinon	5333415		1	1		X	1 (0.454)
Dibenz[a,h]anthracene	53703	1,2:5,6-Dibenzanthracene Dibenzo[a,h]anthracene	1*	2,4	U063	X	1# (0.454)
1,2:5,6-Dibenzanthracene	53703	Dibenz[a,h]anthracene Dibenzo[a,h]anthracene	1*	2,4	U063	X	1# (0.454)
Dibenzo[a,h]anthracene	53703	Dibenz[a,h]anthracene 1,2:5,6-Dibenzanthracene	1*	2,4	U063	X	1# (0.454)
1,2:7,8-Dibenzopyrene	189559	Dibenz[a,i]pyrene	1*	4	U064	X	1# (0.454)
Dibenz[a,i]pyrene	189559	1,2:7,8-Dibenzopyrene	1*	4	U064	X	1#(0.454)
1,2-Dibromo-3-chloropropane	96128	Propane, 1,2-dibromo-3-chloro-	1*	4	U066	X	1# (0.454)
** Dibutyl phthalate	84742	1,2-Benzenedicarboxylic acid,dibutyl ester Di-n-butyl phthalate n-Butyl phthalate	100	1,2,4	U069	A	10 (4.54)
** Di-n-butyl phthalate	84742	1,2-Benzenedicarboxylic acid,dibutyl ester n-Butyl phthalate Dibutyl phthalate	100	1,2,4	U069	A	10 (4.54)
** Dicamba	1918009		1000	1		C	1000 (454)
** Dichlobenil	1194656		1000	1		B	100 (45.4)
** Dichlone	117806		1	1		X	1 (0.454)
S-(2,3-Dichloroallyl) diisopropylthiocarbamate	2303164	Diallate	1*	4	U062	X	1# (0.454)
3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide	23950585	Pronamide	1*	4	U192	D	5000 (2270)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
** Dichlorobenzene (mixed)	25321226		100	1		B	100 (45.4)
* 1,2-Dichlorobenzene	95501	Benzene, 1,2-dichloro- o-Dichlorobenzene	100	1,2,4	U070	B	100 (45.4)
1,3-Dichlorobenzene	541731	Benzene, 1,3-dichloro- m-Dichlorobenzene	1*	2,4	U071	B	100 (45.4)
* 1,4-Dichlorobenzene	106467	Benzene, 1,4-dichloro- p-Dichlorobenzene	100	1,2,4	U072	B	100 (45.4)
m-Dichlorobenzene	541731	Benzene, 1,3-dichloro- 1,3-Dichlorobenzene	1*	2,4	U071	B	100 (45.4)
* o-Dichlorobenzene	95501	Benzene, 1,2-dichloro- 1,2-Dichlorobenzene	100	1,2,4	U070	B	100 (45.4)
* p-Dichlorobenzene	106467	Benzene, 1,4-dichloro- 1,4-Dichlorobenzene	100	1,2,4	U072	B	100 (45.4)
DICHLOROBENZIDINE			1*	2			**
3,3'-Dichlorobenzidine	91941	(1,1'-Biphenyl)-4,4 diamine,3,3'dichloro-	1*	2,4	U073	X	1# (0.454)
Dichlorobromomethane	75274		1*	2		D	5000 (2270)
1,4-Dichloro-2-butene	764410	2-Butene, 1,4-dichloro-	1*	4	U074	X	1 (0.454)
* Dichlorodifluoromethane	75718	Methane, dichlorodifluoro-	1*	4	U075	D	5000 (2270)
Dichlorodiphenyl dichloroethane	72548	DDD 4,4' DDD TDE	1	1,2,4	U060	X	1# (0.454)
* Dichlorodiphenyl trichloroethane	50293	DDT 4,4'DDT	1	1,2,4	U061	X	1# (0.454)
1,1-Dichloroethane	75343	Ethane, 1,1-dichloro- Ethylidene dichloride	1*	2,4	U076	C	1000 (454)
* 1,2-Dichloroethane	107062	Ethane, 1,2-dichloro- Ethylene dichloride	5000	1,2,4	U077	D	5000# (2270)
* 1,1-Dichloroethylene	75354	Ethene, 1,1-dichloro- Vinylidene chloride	5000	1,2,4	U078	D	5000# (2270)
* 1,2-trans-Dichloroethylene	156605	Ethene, trans-1,2-dichloro-	1*	2,4	U079	C	1000 (454)
Dichloroethyl ether	111444	Bis (2-chloroethyl) ether Ethane, 1,1'-oxybis(2-chloro-	1*	2,4	U025	X	1# (0.454)
2,4-Dichlorophenol	120832	Phenol, 2,4-dichloro-	1*	2,4	U081	B	100 (45.4)
2,6-Dichlorophenol	87650	Phenol, 2,6-dichloro-	1*	4	U082	B	100 (45.4)
** 2,4-Dichlorophenoxyacetic acid, salts and esters	94757	2,4-D Acid 2,4-D, salts and esters	100	1,4	U240	B	100 (45.4)
Dichlorophenylarsine	696286	Phenyl,dichloroarsine	1*	4	P036	X	1# (0.454)
** Dichloropropane	26638197		5000	1		C	1000 (454)
1,1-Dichloropropane	78999						
1,3-Dichloropropane	142289						
* 1,2-Dichloropropane	78875	Propylene dichloride	5000	1,2,4	U083	C	1000 (454)
* Dichloropropane - Dichloropropene (mixture)	8003198		5000	1		D	5000## (2270)
Dichloropropene 2,3-Dichloropropene	26952238 78886		5000	1		D	5000## (2270)
1,3-Dichloropropene	542756	Propene, 1,3-dichloro-	5000	1,2,4	U084	D	5000## (2270)
** 2,2-Dichloropropionic acid	75990		5000	1		D	5000 (2270)
** Dichlorvos	62737		10	1		A	10 (4.54)
* Dieldrin	60571	1,2,3,4,10,10-Hexachloro-6,7-epoxy- 1,4,4a,5,6,7,8,8a octahydro-endo,exo- 1,4,5,8- dimethanonaphthalene	1	1,2,4	P037	X	1# (0.454)
1,2,3,4-Diepoxybutane	1464535	2,2'-Bioxirane	1*	4	U085	X	1# (0.454)
* Diethylamine	109897		1000	1		C	1000## (454)
Diethylarsine	692422	Arsine, diethyl-	1*	4	P038	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance*	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
#1,4-Diethylene dioxide	123911	1,4-Dioxane	1*	4	U108	X	1# (0.454)
N,N'-Diethylhydrazine	1615801	Hydrazine, 1,2-diethyl-	1*	4	U086	X	1# (0.454)
##O,O-Diethyl S-[2-(ethylthio)ethyl]phosphorodithioate	298044	Disulfoton	1	1,4	P039	X	1 (0.454)
O,O-Diethyl S-methyl dithiophosphate	3288582	Phosphorodithioic acid, O,O-diethyl S-methylester	1*	4	U087	D	5000 (2270)
Diethyl-p-nitrophenyl phosphate	311455	Phosphoric acid,diethyl p-nitrophenyl ester	1*	4	P041	B	100 (45.4)
Diethyl phthalate	84662	1,2-Benzenedicarboxylic acid,diethyl ester	1*	2,4	U088	C	1000 (454)
O,O-Diethyl O-pyrazinyl phosphorothioate	297972	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	1*	4	P040	B	100 (45.4)
Diethylstilbestrol	56531	4,4'-Stilbenediol, alpha,alpha'-diethyl-	1*	4	U089	X	1# (0.454)
1,2-Dihydro-3,6-pyridazinedione	123331	Maleic hydrazide	1*	4	U148	D	5000 (2270)
Dihydrosafrole	94586	Benzene, 1,2-methylenedioxy-4-propyl-	1*	4	U090	X	1# (0.454)
Diisopropyl fluorophosphate	55914	Phosphorofluoridic acid,bis(1-methylethyl) ester	1*	4	P043	B	100 (45.4)
Dimethoate	60515	Phosphorodithioic acid,O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester.	1*	4	P044	A	10 (4.54)
3,3'-Dimethoxybenzidine	119904	(1,1'-Biphenyl)-4,4'diamine,3,3'dimethoxy-	1*	4	U091	X	1# (0.454)
# Dimethylamine	124403	Methanamine, N-methyl-	1000	1,4	U092	C	1000## (454)
Dimethylaminoazobenzene	60117	Benzenamine, N,N-dimethyl-4-phenylazo-	1*	4	U093	X	1# (0.454)
7,12-Dimethylbenz[a]anthracene	57976	1,2-Benzanthracene, 7,12-dimethyl-	1*	4	U094	X	1# (0.454)
3,3'-Dimethylbenzidine	119937	(1,1'Biphenyl)-4,4'-diamine,3,3'-dimethyl-	1*	4	U095	X	1# (0.454)
# alpha,alpha-Dimethylbenzylhydroperoxide	80159	Hydroperoxide, 1-methyl-1-phenylethyl-	1*	4	U096	A	10 (4.54)
3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime.	39196184	Thiofanox	1*	4	P045	B	100 (45.4)
Dimethylcarbamoyl chloride	79447	Carbamoyl chloride, dimethyl-	1*	4	U097	X	1# (0.454)
# 1,1-Dimethylhydrazine	57147	Hydrazine, 1,1-dimethyl-	1*	4	U098	X	1# (0.454)
1,2-Dimethylhydrazine	540738	Hydrazine, 1,2-dimethyl-	1*	4	U099	X	1# (0.454)
# O,O-Dimethyl O-p-nitrophenyl phosphorothioate	298000	Methyl parathion	100	1,4	P071	B	100## (45.4)
Dimethylnitrosamine	62759	N-Nitrosodimethylamine	1*	2,4	P082	X	1# (0.454)
alpha,alpha-Dimethylphenethylamine	122098	Ethanamine, 1,1-dimethyl-2-phenyl-	1*	4	P046	D	5000 (2270)
2,4-Dimethylphenol	105679	Phenol, 2,4-dimethyl-	1*	2,4	U101	B	100 (45.4)
Dimethyl phthalate	131113	1,2-Benzenedicarboxylic acid,dimethyl ester	1*	2,4	U102	D	5000 (2270)
# Dimethyl sulfate	77781	Sulfuric acid, dimethyl ester	1*	4	U103	X	1# (0.454)
# Dinitrobenzene (mixed)	25154545		1000	1		B	100 (45.4)
m-	99650						
o-	528290						
p-	100254						
4,6-Dinitro-o-cresol and salts	534521	Phenol, 2,4-dinitro-6-methyl-, and salts	1*	2,4	P047	A	10 (4.54)
# 4,6-Dinitro-o-cyclohexylphenol	131895	Phenol, 2-cyclohexyl-4,6-dinitro-	1*	4	P034	B	100 (45.4)
# Dinitrophenol	25550587		1000	1		A	10 (4.54)
2,5-	329715						
2,6-	573568						
2,4-Dinitrophenol	51285	Phenol, 2,4-dinitro-	1000	1,2,4	P048	A	10 (4.54)
## Dinitrotoluene	25321146		1000	1,2		C	1000# (454)
3,4-Dinitrotoluene	610399						
2,4-Dinitrotoluene	121142	Benzene, 1-methyl-2,4-dinitro-	1000	1,2,4	U105	C	1000# (454)
Dinoseb	88857	Phenol, 2,4-dinitro-6-(1-methylpropyl)-	1*	4	P020	C	1000 (454)
Di-n-octyl phthalate	117840	1,2-Benzenedicarboxylic acid,di-n-octyl ester	1*	2,4	U107	D	5000 (2270)
# 1,4-Dioxane	123911	1,4-Diethylene dioxide	1*	4	U108	X	1# (0.454)
DIPHENYLHYDRAZINE			1*	2			**
1,2-Diphenylhydrazine	122667	Hydrazine, 1,2-diphenyl-	1*	2,4	U109	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Diphosphoramide, octamethyl-	152169	Octamethylpyrophosphoramide	1*	4	P085	B	100 (45.4)
Dipropylamine	142847	1-Propanamine, N-propyl-	1*	4	U110	D	5000 (2270)
Di-n-propylnitrosamine	621647	N-Nitrosodi-n-propylamine	1*	2,4	U111	X	1# (0.454)
※※Diquat	85007 2764729		1000	1		C	1000 (454)
※※Disulfoton	298044	O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate	1	1,4	P039	X	1 (0.454)
2,4-Dithiobiuret	541537	Thioimidodicarbonic diamide	1*	4	P049	B	100 (45.4)
※Dithiopyrophosphoric acid, tetraethyl ester	3689245	Tetraethyldithiopyrophosphate	1*	4	P109	B	100 (45.4)
※※Diuron	330541		100	1		B	100 (45.4)
※※Dodecylbenzenesulfonic acid	27176870		1000	1		C	1000 (454)
※※Endosulfan	115297	5-Norbornene-2,3-dimethanol,1,4,5,6,7,7-hexachloro, cyclic sulfite.	1	1,2,4	P050	X	1 (0.454)
alpha - Endosulfan	959988		1*	2		X	1 (0.454)
beta - Endosulfan	33213659		1*	2		X	1 (0.454)
ENDOSULFAN AND METABOLITES			1*	2			**
Endosulfan sulfate	1031078		1*	2		X	1 (0.454)
Endothall	145733	7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid	1*	4	P088	C	1000 (454)
※※Endrin	72208	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo- 1,4:5,8-dimethanonaphthalene.	1	1,2,4	P051	X	1 (0.454)
Endrin aldehyde	7421934		1*	2		X	1 (0.454)
ENDRIN AND METABOLITES			1*	2			**
※※Epichlorohydrin	106898	1-Chloro-2,3-epoxypropane Oxirane, 2-(chloromethyl)-	1000	1,4	U041	C	1000# (454)
Epinephrine	51434	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-	1*	4	P042	C	1000 (454)
※Ethanal	75070	Acetaldehyde	1000	1,4	U001	C	1000 (454)
Ethanamine, 1,1-dimethyl-2-phenyl-	122098	alpha,alpha-Dimethylphenethylamine	1*	4	P046	D	5000 (2270)
Ethanamine, N-ethyl-N-nitroso-	55185	N-Nitrosodiethylamine	1*	4	U174	X	1# (0.454)
※Ethane, 1,2-dibromo-	106934	Ethylene dibromide	1000	1,4	U067	C	1000# (454)
Ethane, 1,1-dichloro-	75343	1,1-Dichloroethane Ethylidene dichloride	1*	2,4	U076	C	1000 (454)
※Ethane, 1,2-dichloro-	107062	1,2-Dichloroethane Ethylene dichloride	5000	1,2,4	U077	D	5000# (2270)
※Ethane, 1,1,1,2,2,2-hexachloro-	67721	Hexachloroethane	1*	2,4	U131	X	1# (0.454)
Ethane, 1,1'-[methylenebis(oxy)]bis(2-chloro-	111911	Bis(2-chloroethoxy) methane	1*	2,4	U024	C	1000 (454)
※Ethane, 1,1'-oxybis-	60297	Ethyl ether	1*	4	U117	B	100 (45.4)
Ethane, 1,1'-oxybis(2-chloro-	111444	Bis (2-chloroethyl) ether Dichloroethyl ether	1*	2,4	U025	X	1# (0.454)
Ethane, pentachloro-	76017	Pentachloroethane	1*	4	U184	X	1## (0.454)
Ethane, 1,1,1,2-tetrachloro-	630206	1,1,1,2-Tetrachloroethane	1*	4	U208	X	1# (0.454)
※Ethane, 1,1,2,2-tetrachloro-	79345	1,1,2,2-Tetrachloroethane	1*	2,4	U209	X	-1# (0.454)
Ethane, 1,1,2-trichloro-	79005	1,1,2-Trichloroethane	1*	2,4	U227	X	1# (0.454)
※※Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)-	72435	Methoxychlor	1	1,4	U247	X	1 (0.454)
1,2-Ethanediylbiscarbamodithioic acid	111546	Ethylenebis(dithiocarbamic acid)	1*	4	U114	D	5000 (2270)
Ethanenitrile	75058	Acetonitrile	1*	4	U003	D	5000 (2270)
Ethanethioamide	62555	Thioacetamide	1*	4	U218	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Ethanol, 2,2'-(nitrosoimino)bis-	1116547	N-Nitrosodiethanolamine	1*	4	U173	X	1# (0.454)
Ethanone, 1-phenyl-	98862	Acetophenone	1*	4	U004	D	5000 (2270)
※Ethanoyl chloride	75365	Acetyl chloride	5000	1,4	U006	D	5000 (2270)
Ethenamine, N-methyl-N-nitroso-	4549400	N-Nitrosomethylvinylamine	1*	4	P084	X	1# (0.454)
※Ethene, chloro-	75014	Vinyl chloride	1*	2,3,4	U043	X	1# (0.454)
Ethene, 2-chloroethoxy-	110758	2-Chloroethyl vinyl ether	1*	2,4	U042	C	1000 (454)
※Ethene, 1,1-dichloro-	75354	1,1-Dichloroethylene Vinylidene chloride	5000	1,2,4	U078	D	5000# (2270)
※Ethene, 1,1,2,2-tetrachloro-	127184	Tetrachloroethylene	1*	2,4	U210	X	1# (0.454)
Ethene, trans-1,2-dichloro-	156605	1,2-trans-Dichloroethylene	1*	2,4	U079	C	1000 (454)
※※Ethion	563122		10	1		A	10## (4.54)
※Ethyl acetate	141786	Acetic acid, ethyl ester	1*	4	U112	D	5000 (2270)
※Ethyl acrylate	140885	2-Propenoic acid, ethyl ester	1*	4	U113	C	1000 (454)
※Ethylbenzene	100414		1000	1,2		C	1000 (454)
Ethyl carbamate (Urethan)	51796	Carbamic acid, ethyl ester	1*	4	U238	X	1# (0.454)
Ethyl cyanide	107120	Propanenitrile	1*	4	P101	A	10 (4.54)
Ethyl 4,4'-dichlorobenzilate	510156	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	1*	4	U038	X	1# (0.454)
※Ethylene dibromide	106934	Ethane, 1,2-dibromo-	1000	1,4	U067	C	1000# (454)
※Ethylene dichloride	107062	1,2-Dichloroethane Ethane, 1,2-dichloro-	5000	1,2,4	U077	D	5000# (2270)
※Ethylene oxide	75218	Oxirane	1*	4	U115	X	1# (0.454)
Ethylenebis(dithiocarbamic acid)	111546	1,2-Ethanediylbiscarbamodithioic acid	1*	4	U114	D	5000 (2270)
※※Ethylenediamine	107153		1000	1		D	5000 (2270)
※※Ethylenediamine tetraacetic acid (EDTA)	60004		5000	1		D	5000 (2270)
Ethylenethiourea	96457	2-Imidazolidinethione	1*	4	U116	X	1# (0.454)
※Ethylenimine	151564	Aziridine	1*	4	P054	X	1# (0.454)
※Ethyl ether	60297	Ethane, 1,1'-oxybis-	1*	4	U117	B	100 (45.4)
Ethylidene dichloride	75343	1,1-Dichloroethane Ethane, 1,1-dichloro-	1*	2,4	U076	C	1000 (454)
Ethyl methacrylate	97632	2-Propenoic acid, 2-methyl-, ethyl ester	1*	4	U118	C	1000 (454)
Ethyl methanesulfonate	62500	Methanesulfonic acid, ethyl ester	1*	4	U119	X	1# (0.454)
Famphur	52857	Phosphorothioic acid, O,O-dimethyl-O-[p-[(dimethylamino)- sulfonyl]phenyl] ester	1*	4	P097	C	1000 (454)
※※Ferric ammonium citrate	1185575		1000	1		C	1000 (454)
※※Ferric ammonium oxalate	2944674 55488874		1000	1		C	1000 (454)
※Ferric chloride	7705080		1000	1		C	1000 (454)
Ferric dextran	9004664	Iron dextran	1*	4	U139	X	1## (0.454)
※※Ferric fluoride	7783508		100	1		B	100 (45.4)
※※Ferric nitrate	10421484		1000	1		C	1000 (454)
※※Ferric sulfate	10028225		1000	1		C	1000 (454)
※※Ferrous ammonium sulfate	10045893		1000	1		C	1000 (454)
※※Ferrous chloride	7758943		100	1		B	100 (45.4)
※※Ferrous sulfate	7720787 7782630		1000	1		C	1000 (454)
Fluoroacetic acid, sodium salt	62748	Acetic acid, fluoro-, sodium salt	1*	4	P058	A	10 (4.54)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Fluoranthene	206440	Benzo[j,k]fluorene	1*	2,4	U120	X	1## (0.454)
Fluorene	86737		1*	2		X	1## (0.454)
*Fluorine	7782414		1*	4	P056	A	10 (4.54)
Fluoroacetamide	640197	Acetamide, 2-fluoro-	1*	4	P057	B	100 (45.4)
*Formaldehyde	50000	Methylene oxide	1000	1,4	U122	C	1000# (454)
*Formic acid	64186	Methanoic acid	5000	1,4	U123	D	5000 (2270)
Fulminic acid, mercury(II)salt	628864	Mercury fulminate	1*	4	P065	X	1## (0.454)
**Fumaric acid	110178		5000	1		D	5000 (2270)
Furan	110009	Furfuran	1*	4	U124	B	100 (45.4)
*Furan, tetrahydro-	109999	Tetrahydrofuran	1*	4	U213	C	1000 (454)
*2-Furancarboxaldehyde	98011	Furfural	1000	1,4	U125	D	5000 (2270)
**2,5-Furandione	108316	Maleic anhydride	5000	1,4	U147	D	5000 (2270)
*Furfural	98011	2-Furancarboxaldehyde	1000	1,4	U125	D	5000 (2270)
Furfuran	110009	Furan	1*	4	U124	B	100 (45.4)
D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	18883664	Streptozotocin	1*	4	U206	X	1# (0.454)
Glycidylaldehyde	765344	1-Propanal, 2,3-epoxy-	1*	4	U126	X	1# (0.454)
Guanidine, N-nitroso-N-methyl-N'-nitro-	70257	N-Methyl-N'-nitro-N-nitrosoguanidine	1*	4	U163	X	1# (0.454)
**Guthion	86500		1	1		X	1 (0.454)
HALOETHERS			1*	2			**
HALOMETHANES			1*	2			**
**Heptachlor	76448	4,7-Methano-1H-indene,1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	1	1,2,4	P059	X	1#(0.454)
HEPTACHLOR AND METABOLITES			1*	2			**
Heptachlor epoxide	1024573		1*	2		X	1# (0.454)
Hexachlorobenzene	118741	Benzene, hexachloro-	1*	2,4	U127	X	1# (0.454)
Hexachlorobutadiene	87683	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1*	2,4	U128	X	1# (0.454)
HEXACHLOROCYCLOHEXANE (all isomers)	608731		1*	2			**
*Hexachlorocyclohexane (gamma isomer)	58899	gamma - BHC Lindane	1	1,2,4	U129	X	1# (0.454)
**Hexachlorocyclopentadiene	77474	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	1	1,2,4	U130	X	1# (0.454)
**1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo- 1,4:5,8-dimethanonaphthalene.	72208	Endrin	1	1,2,4	P051	X	1 (0.454)
*1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo- 1,4:5,8-dimethanonaphthalene.	60571	Dieldrin	1	1,2,4	P037	X	1# (0.454)
*Hexachloroethane	67721	Ethane, 1,1,1,2,2,2-hexachloro-	1*	2,4	U131	X	1# (0.454)
Hexachlorohexahydro-endo,endo-dimethanonaphthalene	465736	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-endo,endo- dimethanonaphthalene	1*	4	P060	X	1 (0.454)
1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-endo,endo- dimethanonaphthalene	465736	Hexachlorohexahydro-endo,endo-dimethanonaphthalene	1*	4	P060	X	1 (0.454)
*1,2,3,4,10-10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8- endo, exo-dimethanonaphthalene	309002	Aldrin	1	1,2,4	P004	X	1# (0.454)
Hexachlorophene	70304	2,2'-Methylenebis(3,4,6-trichlorophenol)	1*	4	U132	X	1## (0.454)
Hexachloropropene	1888717	1-Propene, 1,1,2,3,3,3-hexachloro-	1*	4	U243	C	1000 (454)
*Hexaethyl tetraphosphate	757584	Tetraphosphoric acid, hexaethyl ester	1*	4	P062	B	100 (45.4)
*Hydrazine	302012	Diamine	1*	4	U133	X	1# (0.454)
Hydrazine 1,2-diethyl-	1615801	N,N'-Diethylhydrazine	1*	4	U086	X	1# (0.454)
*Hydrazine, 1,1-dimethyl-	57147	1,1-Dimethylhydrazine	1*	4	U098	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Hydrazine, 1,2-dimethyl-	540738	1,2-Dimethylhydrazine	1*	4	U099	X	1# (0.454)
Hydrazine, 1,2-diphenyl-	122667	1,2-Diphenylhydrazine	1*	2,4	U109	X	1# (0.454)
* Hydrazine, methyl-	60344	Methyl hydrazine	1*	4	P068	A	10 (4.54)
Hydrazinecarbothioamide	79196	Thiosemicarbazide	1*	4	P116	B	100 (45.4)
* Hydrochloric acid	7647010		5000	1		D	5000 (2270)
* Hydrocyanic acid	74908	Hydrogen cyanide	10	1,4	P063	A	10 (4.54)
* Hydrofluoric acid	7664393	Hydrogen fluoride	5000	1,4	U134	B	100 (45.4)
* Hydrogen cyanide	74908	Hydrocyanic acid	10	1,4	P063	A	10 (4.54)
* Hydrogen fluoride	7664393	Hydrofluoric acid	5000	1,4	U134	B	100 (45.4)
* Hydrogen phosphide	7803512	Phosphine	1*	4	P096	B	100 (45.4)
* Hydrogen sulfide	7783064	Hydrosulfuric acid Sulfur hydride	100	1,4	U135	B	100## (45.4)
* Hydroperoxide, 1-methyl-1-phenylethyl-	80159	alpha,alpha-Dimethylbenzylhydroperoxide	1*	4	U096	A	10 (4.54)
Hydrosulfuric acid	7783064	Hydrogen sulfide Sulfur hydride	100	1,4	U135	B	100## (45.4)
* Hydroxydimethylarsine oxide	75605	Cacodylic acid	1*	4	U136	X	1# (0.454)
2-Imidazolidinethione	96457	Ethylenethiourea	1*	4	U116	X	1# (0.454)
Indeno(1,2,3-cd)pyrene	193395	1,10-(1,2-Phenylene)pyrene	1*	2,4	U137	X	1# (0.454)
Iron dextran	9004664	Ferric dextran	1*	4	U139	X	1## (0.454)
Isobutyl alcohol	78831	1-Propanol, 2-methyl-	1*	4	U140	D	5000 (2270)
Isocyanic acid, methyl ester	624839	Methyl isocyanate	1*	4	P064	X	1###(0.454)
Isophorone	78591		1*	2		D	5000 (2270)
* Isoprene	78795		1000	1		C	1000## (454)
** Isopropanolamine dodecylbenzenesulfonate	42504461		1000	1		C	1000 (454)
Isosafrole	120581	Benzene, 1,2-methylenedioxy-4-propenyl-	1*	4	U141	X	1# (0.454)
3(2H)-Isoxazolone, 5-(aminomethyl)-	2763964	5-(Aminomethyl)-3-isoxazolol	1*	4	P007	C	1000 (454)
** Kelthane	115322		5000	1		A	10 (4.54)
** Kepone	143500	Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta[c,d]-pentalen-2-one.	1	1,4	U142	X	1# (0.454)
Lasiocarpine	303344		1*	4	U143	X	1# (0.454)
Lead 11	7439921		1*	2		X	1## (0.454)
** Lead acetate	301042	Acetic acid, lead salt	5000	1,4	U144	D	5000# (2270)
LEAD AND COMPOUNDS			1*	2			**
* Lead arsenate	7784409 7645252 10102484		5000	1		D	5000# (2270)
* Lead chloride	7758954		5000	1		D	5000## (2270)
** Lead fluoborate	13814965		5000	1		D	5000## (2270)
** Lead fluoride	7783462		1000	1		C	1000## (454)
** Lead iodide	10101630		5000	1		D	5000## (2270)
* Lead nitrate	10099748		5000	1		D	5000## (2270)
Lead phosphate	7446277	Phosphoric acid, lead salt	1*	4	U145	X	1# (0.454)
** Lead stearate	7428480 1072351 56189094 52652592		5000	1		D	5000## (2270)
Lead subacetate	1335326		1*	4	U146	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
✱ Lead sulfate	15739807 7446142		5000	1		D	5000## (2270)
✱✱ Lead sulfide	1314870		5000	1		D	5000## (2270)
✱✱ Lead thiocyanate	592870		5000	1		D	5000## (2270)
✱ Lindane	58899	gamma - BHC Hexachlorocyclohexane (gamma isomer)	1	1,2,4	U129	X	1# (0.454)
✱✱ Lithium chromate	14307358		1000	1		C	1000# (454)
✱ Malathion	121755		10	1		B	100 (45.4)
✱✱ Maleic acid	110167		5000	1		D	5000 (2270)
✱✱ Maleic anhydride	108316	2,5-Furandione	5000	1,4	U147	D	5000 (2270)
Maleic hydrazide	123331	1,2-Dihydro-3,6-pyridazinedione	1*	4	U148	D	5000 (2270)
Malononitrile	109773	Propanedinitrile	1*	4	U149	C	1000 (454)
Melphalan	148823	Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-,L-	1*	4	U150	X	1# (0.454)
✱ Mercaptodimethur	2032657		100	1		A	10 (4.54)
✱✱ Mercuric cyanide	592041		1	1		X	1 (0.454)
✱ Mercuric nitrate	10045940		10	1		A	10## (4.54)
✱ Mercuric sulfate	7783359		10	1		A	10## (4.54)
✱✱ Mercuric thiocyanate	592858		10	1		A	10## (4.54)
✱ Mercurous nitrate	10415755 7782867		10	1		A	10## (4.54)
✱ Mercury	7439976		1*	2,3,4	U151	X	1 (0.454)
✱ MERCURY AND COMPOUNDS			1*	2			
Mercury, (acetato-O)phenyl-	62384	Phenylmercuric acetate	1*	4	P092	X	1##(0.454)
Mercury fulminate	628864	Fulminic acid, mercury(II)salt	1*	4	P065	X	1## (0.454)
Methacrylonitrile	126987	2-Propenenitrile, 2-methyl-	1*	4	U152	C	1000 (454)
✱ Methanamine, N-methyl-	124403	Dimethylamine	1000	1,4	U092	C	1000## (454)
✱ Methane, bromo-	74839	Methyl bromide	1*	2,4	U029	C	1000 (454)
✱ Methane, chloro-	74873	Methyl chloride	1*	2,4	U045	X	1## (0.454)
Methane, chloromethoxy-	107302	Chloromethyl methyl ether	1*	4	U046	X	1# (0.454)
Methane, dibromo-	74953	Methylene bromide	1*	4	U068	C	1000 (454)
✱ Methane, dichloro-	75092	Methylene chloride	1*	2,4	U080	C	1000 (454)
✱ Methane, dichlorodifluoro-	75718	Dichlorodifluoromethane	1*	4	U075	D	5000 (2270)
Methane, iodo-	74884	Methyl iodide	1*	4	U138	X	1# (0.454)
Methane, oxybis(chloro-	542881	Bis(chloromethyl) ether	1*	4	P016	X	1# (0.454)
✱ Methane, tetrachloro-	56235	Carbon tetrachloride	5000	1,2,4	U211	D	5000# (2270)
✱ Methane, tetranitro-	509148	Tetranitromethane	1*	4	P112	A	10 (4.54)
Methane, tribromo-	75252	Bromoform	1*	2,4	U225	B	100 (45.4)
✱ Methane, trichloro-	67663	Chloroform	5000	1,2,4	U044	D	5000# (2270)
Methane, trichlorofluoro-	75694	Trichloromonofluoromethane	1*	4	U121	D	5000 (2270)
Methanesulfonic acid, ethyl ester	62500	Ethyl methanesulfonate	1*	4	U119	X	1# (0.454)
✱ Methanethiol	74931	Methylmercaptan Thiomethanol	100	1,4	U153	B	100 (45.4)
Methanesulfenyl chloride, trichloro-	594423	Trichloromethanesulfenyl chloride	1*	4	P118	B	100 (45.4)
✱✱ 4,7-Methano-1H-indene,1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	76448	Heptachlor	1	1,2,4	P059	X	1# (0.454)
✱ Methanoic acid	64186	Formic acid	5000	1,4	U123	D	5000 (2270)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
# 4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro- 3a,4,7,7a-tetrahydro-	57749	Chlordane Chlordane, technical	1	1,2,4	U036	X	1# (0.454)
# Methanol	67561	Methyl alcohol	1*	4	U154	D	5000 (2270)
Methapyrilene	91805	Pyridine, 2-[(2-(dimethylamino)ethyl)-2-thenylamino]-	1*	4	U155	D	5000 (2270)
Methomyl	16752775	Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester	1*	4	P066	B	100 (45.4)
## Methoxychlor	72435	Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)-	1	1,4	U247	X	1 (0.454)
# Methyl alcohol	67561	Methanol	1*	4	U154	D	5000 (2270)
# 2-Methylaziridine	75558	1,2-Propylenimine	1*	4	P067	X	1# (0.454)
# Methyl bromide	74839	Methane, bromo-	1*	2,4	U029	C	1000 (454)
1-Methylbutadiene	504609	1,3-Pentadiene	1*	4	U186	B	100 (45.4)
# Methyl chloride	74873	Methane, chloro-	1*	2,4	U045	X	1## (0.454)
Methyl chlorocarbonate	79221	Carbonochloridic acid, methyl ester	1*	4	U156	C	1000 (454)
# Methyl chloroform	71556	1,1,1-Trichloroethane	1*	2,4	U226	C	1000 (454)
4,4'-Methylenebis(2-chloroaniline)	101144	Benzenamine, 4,4'-methylenebis(2-chloro-	1*	4	U158	X	1# (0.454)
2,2'-Methylenebis(3,4,6-trichlorophenol)	70304	Hexachlorophene	1*	4	U132	X	1## (0.454)
3-Methylcholanthrene	56495	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	1*	4	U157	X	1# (0.454)
Methylene bromide	74953	Methane, dibromo-	1*	4	U068	C	1000 (454)
# Methylene chloride	75092	Methane, dichloro-	1*	2,4	U080	C	1000 (454)
# Methylene oxide	50000	Formaldehyde	1000	1,4	U122	C	1000# (454)
# Methyl ethyl ketone	78933	2-Butanone	1*	4	U159	D	5000 (2270)
Methyl ethyl ketone peroxide	1338234	2-Butanone peroxide	1*	4	U160	A	10 (4.54)
# Methyl hydrazine	60344	Hydrazine, methyl-	1*	4	P068	A	10 (4.54)
Methyl iodide	74884	Methane, iodo-	1*	4	U138	X	1# (0.454)
Methyl isobutyl ketone	108101	4-Methyl-2-pentanone	1*	4	U161	D	5000 (2270)
Methyl isocyanate	624839	Isocyanic acid, methyl ester	1*	4	P064	X	1###(0.454)
# 2-Methyllactonitrile	75865	Acetone cyanohydrin Propanenitrile, 2-hydroxy-2-methyl-	10	1,4	P069	A	10 (4.54)
# Methylmercaptan	74931	Methanethiol Thiomethanol	100	1,4	U153	B	100 (45.4)
# Methyl methacrylate	80626	2-Propenoic acid, 2-methyl-, methyl ester	5000	1,4	U162	C	1000 (454)
N-Methyl-N'-nitro-N-nitrosoguanidine	70257	Guanidine, N-nitroso-N-methyl-N'-nitro-	1*	4	U163	X	1# (0.454)
# Methyl parathion	298000	O,O-Dimethyl O-p-nitrophenyl phosphorothioate	100	1,4	P071	B	100## (45.4)
4-Methyl-2-pentanone	108101	Methyl isobutyl ketone	1*	4	U161	D	5000 (2270)
Methylthiouracil	56042	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	1*	4	U164	X	1# (0.454)
## Mevinphos	7786347		1	1		A	10 (4.54)
## Mexacarbate	315184		1000	1		C	1000 (454)
# Mitomycin C	50077	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione,6-amino-8-[((aminocarbonyl)oxy)methyl]- 1,1a,2,8,8a,8b- hexahydro-8a-methoxy- 5-methyl-	1*	4	U010	X	1# (0.454)
# Monoethylamine	75047		1000	1		C	1000## (454)
# Monomethylamine	74895		1000	1		B	100 (45.4)
## Naled	300765		10	1		A	10 (4.54)
5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L- lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro- 6,8,11-trihydroxy- 1-methoxy-	20830813	Daunomycin	1*	4	U059	X	1# (0.454)
# Naphthalene	91203		5000	1,2,4	U165	B	100 (45.4)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Naphthalene, 2-chloro-	91587	beta-Chloronaphthalene 2-Chloronaphthalene	1*	2,4	U047	D	5000 (2270)
1,4-Naphthalenedione	130154	1,4-Naphthoquinone	1*	4	U166	D	5000 (2270)
2,7-Naphthalenedisulfonic acid,3,3'-[(3,3'-dimethyl- (1,1'-biphenyl)-4,4'-diyl)- bis(azo)]bis(5-amino- 4-hydroxy)-tetrasodium salt.	72571	Trypan blue	1*	4	U236	X	1# (0.454)
* Naphthenic acid	1338245		100	1		B	100 (45.4)
1,4-Naphthoquinone	130154	1,4-Naphthalenedione	1*	4	U166	D	5000 (2270)
1-Naphthylamine	134327	alpha-Naphthylamine	1*	4	U167	X	1# (0.454)
2-Naphthylamine	91598	beta-Naphthylamine	1*	4	U168	X	1# (0.454)
alpha-Naphthylamine	134327	1-Naphthylamine	1*	4	U167	X	1# (0.454)
beta-Naphthylamine	91598	2-Naphthylamine	1*	4	U168	X	1# (0.454)
2-Naphthylamine, N,N-bis(2-chloroethyl)-	494031	Chlornaphazine	1*	4	U026	X	1# (0.454)
alpha-Naphthylthiourea	86884	Thiourea, 1-naphthalenyl-	1*	4	P072	B	100 (45.4)
* Nickel ††	7440020		1*	2		X	1# (0.454)
NICKEL AND COMPOUNDS			1*	2			**
** Nickel ammonium sulfate	15699180		5000	1		D	5000# (2270)
* Nickel carbonyl	13463393	Nickel tetracarbonyl	1*	4	P073	X	1# (0.454)
** Nickel chloride	7718549 37211055		5000	1		D	5000# (2270)
* Nickel cyanide	557197	Nickel(II) cyanide	1*	4	P074	X	1# (0.454)
* Nickel(II) cyanide	557197	Nickel cyanide	1*	4	P074	X	1# (0.454)
** Nickel hydroxide	12054487		1000	1		C	1000# (454)
** Nickel nitrate	14216752		5000	1		D	5000# (2270)
** Nickel sulfate	7786814		5000	1		D	5000# (2270)
* Nickel tetracarbonyl	13463393	Nickel carbonyl	1*	4	P073	X	1# (0.454)
* Nicotine and salts	54115	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts	1*	4	P075	B	100 (45.4)
* Nitric acid	7697372		1000	1		C	1000 (454)
* Nitric oxide	10102439	Nitrogen(II) oxide	1*	4	P076	A	10 (4.54)
* p-Nitroaniline	100016	Benzenamine, 4-nitro-	1*	4	P077	D	5000 (2270)
* Nitrobenzene	98953	Benzene, nitro-	1000	1,2,4	U169	C	1000 (454)
* Nitrogen dioxide	10102440 10544726	Nitrogen(IV) oxide	1000	1,4	P078	A	10 (4.54)
* Nitrogen(II) oxide	10102439	Nitric oxide	1*	4	P076	A	10 (4.54)
* Nitrogen(IV) oxide	10102440 10544726	Nitrogen dioxide	1000	1,4	P078	A	10 (4.54)
Nitroglycerine	55630	1,2,3-Propanetriol, trinitrate-	1*	4	P081	A	10 (4.54)
** Nitrophenol (mixed) m- o- p-	25154556 554847 88755 100027	 2-Nitrophenol 4-Nitrophenol Phenol, 4-nitro-	1000	1		B	100 (45.4)
p-Nitrophenol	100027	4-Nitrophenol Phenol, 4-nitro-	1000	1,2,4	U170	B	100 (45.4)
2-Nitrophenol	88755	o-Nitrophenol	1000	1,2		B	100 (45.4)
4-Nitrophenol	100027	p-Nitrophenol Phenol, 4-nitro-	1000	1,2,4	U170	B	100 (45.4)
NITROPHENOLS			1*	2			**
2-Nitropropane	79469	Propane, 2-nitro-	1*	4	U171	X	1# (0.454)
NITROSAMINES			1*	2			**

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
N-Nitrosodi-n-butylamine	924163	1-Butanamine, N-butyl-N-nitroso-	1*	4	U172	X	1# (0.454)
N-Nitrosodiethanolamine	1116547	Ethanol, 2,2'-(nitrosoimino)bis-	1*	4	U173	X	1# (0.454)
N-Nitrosodiethylamine	55185	Ethanamine, N-ethyl-N-nitroso-	1*	4	U174	X	1# (0.454)
N-Nitrosodimethylamine	62759	Dimethylnitrosamine	1*	2,4	P082	X	1# (0.454)
N-Nitrosodiphenylamine	86306		1*	2		B	100 (45.4)
N-Nitrosodi-n-propylamine	621647	Di-n-propylnitrosamine	1*	2,4	U111	X	1# (0.454)
N-Nitroso-N-ethylurea	759739	Carbamide, N-ethyl-N-nitroso-	1*	4	U176	X	1# (0.454)
N-Nitroso-N-methylurea	684935	Carbamide, N-methyl-N-nitroso-	1*	4	U177	X	1# (0.454)
N-Nitroso-N-methylurethane	615532	Carbamic acid, methylnitroso-,ethyl ester	1*	4	U178	X	1# (0.454)
N-Nitrosomethylvinylamine	4549400	Ethenamine, N-methyl-N-nitroso-	1*	4	P084	X	1# (0.454)
N-Nitrosopiperidine	100754	Pyridine, hexahydro-N-nitroso-	1*	4	U179	X	1# (0.454)
N-Nitrosopyrrolidine	930552	Pyrrole, tetrahydro-N-nitroso-	1*	4	U180	X	1# (0.454)
## Nitrotoluene	1321126		1000	1		C	1000 (454)
m-	99081						
o-	88722						
p-	99990						
5-Nitro-o-toluidine	99558	Benzenamine, 2-methyl-5-nitro-	1*	4	U181	X	1# (0.454)
## 5-Norbornene-2,3-dimethanol,1,4,5,6,7,7-hexachloro, cyclic sulfite.	115297	Endosulfan	1	1,2,4	P050	X	1 (0.454)
Octamethylpyrophosphoramide	152169	Diphosphoramide, octamethyl-	1*	4	P085	B	100 (45.4)
Osmium oxide	20816120	Osmium tetroxide	1*	4	P087	C	1000 (454)
Osmium tetroxide	20816120	Osmium oxide	1*	4	P087	C	1000 (454)
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	145733	Endothall	1*	4	P088	C	1000 (454)
1,2-Oxathiolane, 2,2-dioxide	1120714	1,3-Propane sultone	1*	4	U193	X	1# (0.454)
2H-1,3,2-Oxazaphosphorine,2-[bis(2-chloroethyl)amino] tetrahydro-2-oxide.	50180	Cyclophosphamide	1*	4	U058	X	1# (0.454)
#Oxirane	75218	Ethyleneoxide	1*	4	U115	X	1# (0.454)
##Oxirane, 2-(chloromethyl)-	106898	1-Chloro-2,3-epoxypropane Epichlorohydrin	1000	1,4	U041	C	1000# (454)
##Paraformaldehyde	30525894		1000	1		C	1000 (454)
Paraldehyde	123637	1,3,5-Trioxane, 2,4,6-trimethyl-	1*	4	U182	C	1000 (454)
#Parathion	56382	Phosphorothioic acid,O,O-diethyl O-(p-nitrophenyl) ester	1	1,4	P089	X	1# (0.454)
Pentachlorobenzene	608935	Benzene, pentachloro-	1*	4	U183	X	1## (0.454)
Pentachloroethane	76017	Ethane, pentachloro-	1*	4	U184	X	1## (0.454)
Pentachloronitrobenzene	82688	Benzene, pentachloronitro-	1*	4	U185	X	1# (0.454)
##Pentachlorophenol	87865	Phenol, pentachloro-	10	1,2,4	U242	A	10# (4.54)
1,3-Pentadiene	504609	1-Methylbutadiene	1*	4	U186	B	100 (45.4)
Phenacetin	62442	Acetamide, N-(4-ethoxyphenyl)-	1*	4	U187	X	1# (0.454)
Phenanthrene	85018		1*	2		X	1## (0.454)
Phenol	108952	Benzene, hydroxy-	1000	1,2,4	U188	C	1000## (454)
Phenol, 2-chloro-	95578	2-Chlorophenol o-Chlorophenol	1*	2,4	U048	B	100 (45.4)
Phenol, 4-chloro-3-methyl-	59507	4-Chloro-m-cresol p-Chloro-m-cresol	1*	2,4	U039	D	5000 (2270)
Phenol, 2-cyclohexyl-4,6-dinitro-	131895	4,6-Dinitro-o-cyclohexylphenol	1*	4	P034	B	100 (45.4)
# Phenol, 2,4-dichloro-	120832	2,4-Dichlorophenol	1*	2,4	U081	B	100 (45.4)
Phenol, 2,6-dichloro-	87650	2,6-Dichlorophenol	1*	4	U082	B	100 (45.4)
Phenol, 2,4-dimethyl-	105679	2,4-Dimethylphenol	1*	2,4	U101	B	100 (45.4)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Phenol, 2,4-dinitro-	51285	2,4-Dinitrophenol	1000	1,2,4	P048	A	10 (4.54)
Phenol, 2,4-dinitro-6-(1-methylpropyl)-	88857	Dinoseb	1*	4	P020	C	1000 (454)
Phenol, 2,4-dinitro-6-methyl-, and salts	534521	4,6-Dinitro-o-cresol and salts	1*	2,4	P047	A	10 (4.54)
** Phenol, 4-nitro	100027	p-Nitrophenol 4-Nitrophenol	1000	1,2,4	U170	B	100 (45.4)
Phenol, pentachloro-	87865	Pentachlorophenol	10	1,2,4	U242	A	10# (4.54)
Phenol, 2,3,4,6-tetrachloro-	58902	2,3,4,6-Tetrachlorophenol	1*	4	U212	A	10 (4.54)
Phenol, 2,4,5-trichloro-	95954	2,4,5-Trichlorophenol	10	1,4	U230	A	10# (4.54)
Phenol, 2,4,6-trichloro-	88062	2,4,6-Trichlorophenol	10	1,2,4	U231	A	10# (4.54)
* Phenol, 2,4,6-trinitro-, ammonium salt	131748	Ammonium picrate	1*	4	P009	A	10 (4.54)
Phenyl dichloroarsine	696286	Dichlorophenylarsine	1*	4	P036	X	1# (0.454)
1,10-(1,2-Phenylene)pyrene	193395	Indeno(1,2,3-cd)pyrene	1*	2,4	U137	X	1# (0.454)
Phenylmercuric acetate	62384	Mercury, (acetato-O)phenyl-	1*	4	P092	X	1## (0.454)
N-Phenylthiourea	103855	Thiourea, phenyl-	1*	4	P093	B	100 (45.4)
Phorate	298022	Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	1*	4	P094	X	1## (0.454)
* Phosgene	75445	Carbonyl chloride	5000	1,4	P095	A	10 (4.54)
* Phosphine	7803512	Hydrogen phosphide	1*	4	P096	B	100 (45.4)
* Phosphoric acid	7664382		5000	1		D	5000 (2270)
Phosphoric acid diethyl p-nitrophenyl ester	311455	Diethyl-p-nitrophenyl phosphate	1*	4	P041	B	100 (45.4)
Phosphoric acid, lead salt	7446277	Lead phosphate	1*	4	U145	X	1# (0.454)
Phosphorodithioic acid, O,O-diethyl S-methylester	3288582	O,O-Diethyl S-methyl dithiophosphate	1*	4	U087	D	5000 (2270)
Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	298022	Phorate	1*	4	P094	X	1## (0.454)
Phosphorodithioic acid O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester	60515	Dimethoate	1*	4	P044	A	10 (4.54)
* Phosphorofluoridic acid,bis(1-methylethyl) ester	55914	Diisopropyl fluorophosphate	1*	4	P043	B	100 (45.4)
Phosphorothioic acid,O,O-diethyl O-(p-nitrophenyl) ester	56382	Parathion	1	1,4	P089	X	1# (0.454)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	297972	O,O-Diethyl O-pyrazinyl phosphorothioate	1*	4	P040	B	100 (45.4)
Phosphorothioic acid, O,O-dimethyl O-[p-[(dimethylamino) sulfonyl]phenyl] ester	52857	Famphur	1*	4	P097	C	1000 (454)
* Phosphorus	7723140		1	1		X	1 (0.454)
* Phosphorus oxychloride	10025873		5000	1		C	1000 (454)
* Phosphorus pentasulfide	1314803	Phosphorus sulfide Sulfur phosphide	100	1,4	U189	B	100 (45.4)
* Phosphorus sulfide	1314803	Phosphorus pentasulfide Sulfur phosphide	100	1,4	U189	B	100 (45.4)
* Phosphorus trichloride	7719122		5000	1		C	1000 (454)
PHTHALATE ESTERS			1*	2			**
Phthalic anhydride	85449	1,2-Benzenedicarboxylic acid anhydride	1*	4	U190	D	5000 (2270)
2-Picoline	109068	Pyridine,2-methyl-	1*	4	U191	D	5000 (2270)
* Plumbane, tetraethyl-	78002	Tetraethyl lead	100	1,4	P110	B	100## (45.4)
* POLYCHLORINATED BIPHENYLS (PCBs)	1336363 12674112 11104282 11141165 53469219 12672296 11097691 11096825	Aroclors Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	10	1,2		A	10# (4.54)
POLYNUCLEAR AROMATIC HYDROCARBONS			1*				**

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
§Potassium arsenate	7784410		1000	1		C	1000# (454)
§Potassium arsenite	10124502		1000	1		C	1000# (454)
§Potassium bichromate	7778509		1000	1		C	1000# (454)
# §Potassium chromate	7789006		1000	1		C	1000# (454)
§Potassium cyanide	151508		10	1,4	P098	A	10 (4.54)
§Potassium hydroxide	1310583		1000	1		C	1000 (454)
§Potassium permanganate	7722647		100	1		B	100 (45.4)
Potassium silver cyanide	506616		1*	4	P099	X	1 (0.454)
Pronamide	23950585	3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide	1*	4	U192	D	5000 (2270)
1-Propanal, 2,3-epoxy-	765344	Glycidylaldehyde	1*	4	U126	X	1# (0.454)
Propanal, 2-methyl-2-(methylthio)-,O-[(methylamino) carbonyl]oxime.	116063	Aldicarb	1*	4	P070	X	1 (0.454)
# 1-Propanamine	107108	n-Propylamine	1*	4	U194	D	5000 (2270)
1-Propanamine, N-propyl-	142847	Dipropylamine	1*	4	U110	D	5000 (2270)
Propane, 1,2-dibromo-3-chloro-	96128	1,2-Dibromo-3-chloropropane	1*	4	U066	X	1# (0.454)
Propane, 2-nitro-	79469	2-Nitropropane	1*	4	U171	X	1# (0.454)
Propane, 2,2'-oxybis[2-chloro-	108601	Bis(2-chloroisopropyl) ether	1*	2,4	U027	C	1000 (454)
1,3-Propane sultone	1120714	1,2-Oxathiolane, 2,2-dioxide	1*	4	U193	X	1# (0.454)
Propanedinitrile	109773	Malononitrile	1*	4	U149	C	1000 (4.54)
Propanenitrile	107120	Ethyl cyanide	1*	4	P101	A	10 (4.54)
Propanenitrile, 3-chloro-	542767	3-Chloropropionitrile	1*	4	P027	C	1000 (454)
# Propanenitrile, 2-hydroxy-2-methyl-	75865	Acetone cyanohydrin 2-Methyllactonitrile	10	1,4	P069	A	10 (4.54)
1,2,3-Propanetriol, trinitrate-	55630	Nitroglycerine	1*	4	P081	A	10 (4.54)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	126727	Tris(2,3-dibromopropyl) phosphate	1*	4	U235	X	1# (0.454)
1-Propanol, 2-methyl-	78831	Isobutyl alcohol	1*	4	U140	D	5000 (2270)
# 2-Propanone	67641	Acetone	1*	4	U002	D	5000 (2270)
# 2-Propanone, 1-bromo-	598312	Bromoacetone	1*	4	P017	C	1000 (454)
# §Propargite	2312358		10	1		A	10 (4.54)
Propargyl alcohol	107197	2-Propyn-1-ol	1*	4	P102	C	1000 (454)
# 2-Propenal	107028	Acrolein	1	1,2,4	P003	X	1 (0.454)
2-Propenamide	79061	Acrylamide	1*	4	U007	D	5000 (2270)
Propene, 1,3-dichloro-	542756	1,3-Dichloropropene	5000	1,2,4	U084	D	5000## (2270)
1-Propene, 1,1,2,3,3,3-hexachloro-	1888717	Hexachloropropene	1*	4	U243	C	1000 (454)
# 2-Propenenitrile	107131	Acrylonitrile	100	1,2,4	U009	B	100# (45.4)
2-Propenenitrile, 2-methyl-	126987	Methacrylonitrile	1*	4	U152	C	1000 (454)
# 2-Propenoic acid	79107	Acrylic acid	1*	4	U008	D	5000 (2270)
# 2-Propenoic acid, ethyl ester	140885	Ethyl acrylate	1*	4	U113	C	1000 (454)
2-Propenoic acid, 2-methyl-, ethyl ester	97632	Ethyl methacrylate	1*	4	U118	C	1000 (454)
# 2-Propenoic acid, 2-methyl-, methyl ester	80626	Methyl methacrylate	5000	1,4	U162	C	1000 (454)
# 2-Propen-1-ol	107186	Allyl alcohol	100	1,4	P005	B	100 (45.4)
# Propionic acid	79094		5000	1		D	5000 (2270)
# # Propionic acid, 2-(2,4,5-trichlorophenoxy)-	93721	Silvex 2,4,5-TP acid	100	1,4	U233	B	100 (45.4)
# Propionic anhydride	123626		5000	1		D	5000 (2270)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds (Kg)
n-Propylamine	107108	1-Propanamine	1*	4	U194	D	5000 (2270)
Propylene dichloride	78875	1,2-Dichloropropane	5000	1,2,4	U083	C	1000 (454)
Propylene oxide	75569		5000	1		B	100 (45.4)
1,2-Propylenimine	75558	2-Methylaziridine	1*	4	P067	X	1# (0.454)
2-Propyn-1-ol	107197	Propargyl alcohol	1*	4	P102	C	1000 (454)
Pyrene	129000		1*	2		X	1## (0.454)
Pyrethrins	121299 121211 8003347		1000	1		X	1 (0.454)
4-Pyridinamine	504245	4-Aminopyridine	1*	4	P008	C	1000 (454)
Pyridine	110861		1*	4	U196	X	1## (0.454)
Pyridine, 2-[(2-(dimethylamino)ethyl)-2-thenylamino]-	91805	Methapyrilene	1*	4	U155	D	5000 (2270)
Pyridine, hexahydro-N-nitroso-	100754	N-Nitrosopiperidine	1*	4	U179	X	1# (0.454)
Pyridine 2-methyl-	109068	2-Picoline	1*	4	U191	D	5000 (2270)
Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts	54115	Nicotine and salts	1*	4	P075	B	100 (45.4)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	56042	Methylthiouracil	1*	4	U164	X	1# (0.454)
Pyrophosphoric acid, tetraethyl ester	107493	Tetraethyl pyrophosphate	100	1,4	P111	B	100## (45.4)
Pyrrole, tetrahydro-N-nitroso-	930552	N-Nitrosopyrrolidine	1*	4	U180	X	1§ (0.454)
Quinoline	91225		1000	1		D	5000 (2270)
RADIONUCLIDES			1*	3		X	1§ (0.454)
Reserpine	50555	Yohimban-16-carboxylic acid,11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester	1*	4	U200	D	5000 (2270)
Resorcinol	108463	1,3-Benzenediol	1000	1,4	U201	D	5000 (2270)
Saccharin and salts	81072	1,2-Benzisothiazolin-3-one,1,1-dioxide, and salts	1*	4	U202	X	1# (0.454)
Safrole	94597	Benzene, 1,2-methylenedioxy-4-allyl-	1*	4	U203	X	1# (0.454)
Selenious acid	7783008		1*	4	U204	X	1## (0.454)
Selenium ††	7782492		1*	2		X	1## (0.454)
SELENIUM AND COMPOUNDS			1*	2			**
Selenium dioxide	7446084	Selenious acid	1000	1,4	U204	C	1000## (454)
Selenium disulfide	7488564	Sulfur selenide	1*	4	U205	X	1# (0.454)
Selenium oxide	7446084	Selenium dioxide	1000	1,4	U204	C	1000## (454)
Selenourea	630104	Carbamimidoselenoic acid	1*	4	P103	X	1## (0.454)
L-Serine, diazoacetate (ester)	115026	Azaserine	1*	4	U015	X	1# (0.454)
Silver ††	7440224		1*	2		C	1000 (454)
SILVER AND COMPOUNDS			1*	2			**
Silver cyanide	506649		1*	4	P104	X	1 (0.454)
Silver nitrate	7761888		1	1		X	1 (0.454)
Silvex	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)- 2,4,5-TP acid	100	1,4	U233	B	100 (45.4)
Sodium	7440235		1000	1		A	10 (4.54)
Sodium arsenate	7631892		1000	1		C	1000# (454)
Sodium arsenite	7784465		1000	1		C	1000# (454)
Sodium azide	26628228		1*	4	P105	C	1000 (454)
Sodium bichromate	10588019		1000	1		C	1000# (454)
Sodium bifluoride	1333831		5000	1		D	5000## (2270)
Sodium bisulfite	7631905		5000	1		D	5000 (2270)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code I	RCRA Waste Number	Category	Pounds(Kg)
## Sodium chromate	7775113		1000	1		C	1000# (454)
# Sodium cyanide	143339		10	1,4	P106	A	10 (4.54)
## Sodium dodecylbenzene sulfonate	25155300		1000	1		C	1000 (454)
# Sodium fluoride	7681494		5000	1		C	1000 (454)
## Sodium hydrosulfide	16721805		5000	1		D	5000 (2270)
# Sodium hydroxide	1310732		1000	1		C	1000 (454)
## Sodium hypochlorite	7681529 10022705		100	1		B	100 (45.4)
# Sodium methylate	124414		1000	1		C	1000 (454)
# Sodium nitrite	7632000		100	1		B	100## (45.4)
## Sodium phosphate, dibasic	7558794 10039324 10140655		5000	1		D	5000 (2270)
## Sodium phosphate, tribasic	7601549 7785844 10101890 10361894 7758294 10124568		5000	1		D	5000 (2270)
## Sodium selenite	10102188 7782823		1000	1		C	1000## (454)
4,4'-Stilbenediol, alpha,alpha'-diethyl-	56531	Diethylstilbestrol	1*	4	U089	X	1# (0.454)
Streptozotocin	18883664	D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	1*	4	U206	X	1# (0.454)
## Strontium chromate	7789062		1000	1		C	1000# (454)
Strontium sulfide	1314961		1*	4	P107	B	100 (45.4)
# Strychnidin-10-one, and salts	57249	Strychnine and salts	10	1,4	P108	A	10 (4.54)
# Strychnidin-10-one, 2,3-dimethoxy-	357573	Brucine	1*	4	P018	A	10 (4.54)
# Strychnine and salts	57249	Strychnidin-10-one, and salts	10	1,4	P108	A	10 (4.54)
# Styrene	100425		1000	1		C	1000 (454)
# Sulfur hydride	7783064	Hydrogen sulfide Hydrosulfuric acid	100	1,4	U135	B	100## (45.4)
# Sulfur monochloride	12771083		1000	1		C	1000 (454)
# Sulfur phosphide	1314803	Phosphorus pentasulfide Phosphorus sulfide	100	1,4	U189	B	100 (45.4)
Sulfur selenide	7488564	Selenium disulfide	1*	4	U205	X	1# (0.454)
# Sulfuric acid	7664939 8014957		1000	1		C	1000 (454)
# Sulfuric acid, dimethyl ester	77781	Dimethyl sulfate	1*	4	U103	X	1# (0.454)
# Sulfuric acid, thallium(I) salt	7446186 10031591	Thallium(I) sulfate	1000	1,4	P115	C	1000## (454)
## 2,4,5-T	93765	2,4,5-T acid 2,4,5-Trichlorophenoxyacetic acid	100	1,4	U232	C	1000 (454)
## 2,4,5-T acid	93765	2,4,5-T 2,4,5-Trichlorophenoxyacetic acid	100	1,4	U232	C	1000 (454)
## 2,4,5-T amines	2008460 6369966 6369977 1319728 3813147		100	1		D	5000 (2270)
## 2,4,5-T esters	93798 2545597 61792072 1928478 25168154		100	1		C	1000 (454)
## 2,4,5-T salts	13560991		100	1		C	1000 (454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
** TDE	72548	DDD 4,4' DDD Dichlorodiphenyl dichloroethane	1	1,2,4	U060	X	1# (0.454)
1,2,4,5-Tetrachlorobenzene	95943	Benzene, 1,2,4,5-tetrachloro-	1*	4	U207	D	5000 (2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin(TCDD)	1746016		1*	2		X	1# (0.454)
1,1,1,2-Tetrachloroethane	630206	Ethane,1,1,1,2-tetrachloro-	1*	4	U208	X	1# (0.454)
* 1,1,2,2-Tetrachloroethane	79345	Ethane, 1,1,2,2-tetrachloro-	1*	2,4	U209	X	1# (0.454)
* Tetrachloroethylene	127184	Ethene, 1,1,2,2-tetrachloro-	1*	2,4	U210	X	1# (0.454)
2,3,4,6-Tetrachlorophenol	58902	Phenol, 2,3,4,6-tetrachloro-	1*	4	U212	A	10 (4.54)
* Tetraethyldithiopyrophosphate	3689245	Dithiopyrophosphoric acid,tetraethyl ester	1*	4	P109	B	100 (45.4)
* Tetraethyl lead	78002	Plumbane, tetraethyl-	100	1,4	P110	B	100## (45.4)
** Tetraethyl pyrophosphate	107493	Pyrophosphoric acid, tetraethyl ester	100	1,4	P111	B	100## (45.4)
* Tetrahydrofuran	109999	Furan, tetrahydro-	1*	4	U213	C	1000 (454)
* Tetranitromethane	509148	Methane, tetranitro-	1*	4	P112	A	10 (4.54)
* Tetraphosphoric acid, hexaethyl ester	757584	Hexaethyl tetraphosphate	1*	4	P062	B	100 (45.4)
Thallic oxide	1314325	Thallium(III) oxide	1*	4	P113	X	1## (0.454)
Thallium ††	7440280		1*	2		X	1## (0.454)
* THALLIUM AND COMPOUNDS	-		1*	2			**
* Thallium(I) acetate	563688	Acetic acid, thallium(I) salt	1*	4	U214	X	1## (0.454)
* Thallium(I) carbonate	6533739	Carbonic acid, dithallium (I) salt	1*	4	U215	X	1## (0.454)
Thallium(I) chloride	7791120		1*	4	U216	X	1## (0.454)
Thallium(I) nitrate	10102451		1*	4	U217	X	1## (0.454)
Thallium(III) oxide	1314325	Thallic oxide	1*	4	P113	X	1## (0.454)
Thallium(I) selenide	12039520		1*	4	P114	X	1## (0.454)
* Thallium(I) sulfate	7446186 10031591	Sulfuric acid, thallium(I) salt	1000	1,4	P115	C	1000## (454)
Thioacetamide	62555	Ethanethioamide	1*	4	U218	X	1# (0.454)
Thiofanox	39196184	3,3-Dimethyl-1-(methylthio)-2-butanone,O-[(methylamino) carbonyl] oxime	1*	4	P045	B	100 (45.4)
Thioimidodicarbonic diamide	541537	2,4-Dithiobiuret	1*	4	P049	B	100 (45.4)
* Thiomethanol	74931	Methanethiol Methylmercaptan	100	1,4	U153	B	100 (45.4)
Thiophenol	108985	Benzenethiol	1*	4	P014	B	100 (45.4)
Thiosemicarbazide	79196	Hydrazinecarbothioamide	1*	4	P116	B	100 (45.4)
Thiourea	62566	Carbamide, thio-	1*	4	U219	X	1# (0.454)
Thiourea, (2-chlorophenyl)-	5344821	1-(o-Chlorophenyl)thiourea	1*	4	P026	B	100 (45.4)
Thiourea, 1-naphthalenyl-	86884	alpha-Naphthylthiourea	1*	4	P072	B	100 (45.4)
Thiourea, phenyl-	103855	N-Phenylthiourea	1*	4	P093	B	100 (45.4)
* Thiram	137268	Bis(dimethylthiocarbamoyl) disulfide	1*	4	U244	A	10 (4.54)
* Toluene	108883	Benzene, methyl-	1000	1,2,4	U220	C	1000 (454)
* Toluenediamine	95807 25376458 496720 823405	Diaminotoluene	1*	4	U221	X	1# (0.454)
* Toluene diisocyanate	584849 91087 26471625	Benzene, 2,4-diisocyanatomethyl-	1*	4	U223	B	100 (45.4)
o-Toluidine hydrochloride	636215	Benzenamine, 2-methyl-, hydrochloride	1*	4	U222	X	1# (0.454)
** Toxaphene	8001352	Camphene, octachloro-	1	1,2,4	P123	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
** 2,4,5-TP acid	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)- Silvex	100	1,4	U233	B	100 (45.4)
** 2,4,5-TP acid esters	32534955		100	1		B	100 (45.4)
1H-1,2,4-Triazol-3-amine	61825	Amitrole	1*	4	U011	X	1# (0.454)
** Trichlorfon	52686		1000	1		C	1000## (454)
1,2,4-Trichlorobenzene	120821		1*	2		B	100 (45.4)
* 1,1,1-Trichloroethane	71556	Methyl chloroform	1*	2,4	U226	C	1000 (454)
* 1,1,2-Trichloroethane	79005	Ethane, 1,1,2-trichloro-	1*	2,4	U227	X	1# (0.454)
Trichloroethene	79016	Trichloroethylene	1000	1,2,4	U228	C	1000# (454)
* Trichloroethylene	79016	Trichloroethene	1000	1,2,4	U228	C	1000# (454)
Trichloromethanesulfenyl chloride	594423	Methanesulfenyl chloride, trichloro-	1*	4	P118	B	100 (45.4)
Trichloromonofluoromethane	75694	Methane, trichlorofluoro-	1*	4	U121	D	5000 (2270)
* Trichlorophenol	25167822		10	1		A	10# (4.54)
2,3,4-Trichlorophenol	15950660						
2,3,5-Trichlorophenol	933788						
2,3,6-Trichlorophenol	933755						
2,4,5-Trichlorophenol	95954	Phenol, 2,4,5-trichloro-					
2,4,6-Trichlorophenol	88062	Phenol, 2,4,6-trichloro-					
3,4,5-Trichlorophenol	609198						
2,4,5-Trichlorophenol	95954	Phenol, 2,4,5-trichloro-	10	1,4	U230	A	10# (4.54)
2,4,6-Trichlorophenol	88062	Phenol, 2,4,6-trichloro-	10	1,2,4	U231	A	10# (4.54)
* 2,4,5-Trichlorophenoxyacetic acid	93765	2,4,5-T 2,4,5-T acid	100	1,4	U232	C	1000 (454)
* Triethanolamine dodecylbenzenesulfonate	27323417		1000	1		C	1000 (454)
** Triethylamine	121448		5000	1		D	5000 (2270)
* Trimethylamine	75503		1000	1		C	1000## (454)
* sym-Trinitrobenzene	99354	Benzene, 1,3,5-trinitro-	1*	4	U234	X	1## (0.454)
1,3,5-Trioxane, 2,4,6-trimethyl-	123637	Paraldehyde	1*	4	U182	C	1000 (454)
Tris(2,3-dibromopropyl) phosphate	126727	1-Propanol, 2,3-dibromo-, phosphate (3:1)	1*	4	U235	X	1# (0.454)
Trypan blue	72571	2,7-Naphthalenedisulfonic acid,3,3'-[(3,3'-dimethyl- (1,1'-biphenyl)-4,4'-diyl)- bis(azo)]bis(5-amino-4- hydroxy)-tetrasodium salt.	1*	4	U236	X	1# (0.454)
Unlisted Hazardous Wastes			1*	4			
Characteristic of Ignitability			1*	4	D001	B	100 (45.4)
Characteristic of Corrosivity			1*	4	D002	B	100 (45.4)
Characteristic of Reactivity			1*	4	D003	B	100 (45.4)
Characteristic of EP Toxicity			1*	4			
Arsenic			1*	4	D004	X	1# (0.454)
Barium			1*	4	D005	C	1000 (454)
Cadmium			1*	4	D006	X	1# (0.454)
Chromium			1*	4	D007	X	1# (0.454)
Lead			1*	4	D008	X	1## (0.454)
Mercury			1*	4	D009	X	1 (0.454)
Selenium			1*	4	D010	X	1## (0.454)
Silver			1*	4	D011	X	1 (0.454)
** Endrin			1	1,4	D012	X	1 (0.454)
** Lindane			1	1,4	D013	X	1# (0.454)
** Methoxychlor			1	1,4	D014	X	1 (0.454)
** Toxaphene			1	1,4	D015	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
** 2,4-D			100	1,4	D016	B	100 (45.4)
** 2,4,5-TP			100	1,4	D017	B	100 (45.4)
Uracil, 5-[bis(2-chloroethyl)amino]-	66751	Uracil mustard	1*	4	U237	X	1# (0.454)
Uracil mustard	66751	Uracil, 5-[bis(2-chloroethyl)amino]-	1*	4	U237	X	1# (0.454)
** Uranyl acetate	541093		5000	1		D	5000## (2270)
* Uranyl nitrate	10102064 36478769		5000	1		D	5000## (2270)
Vanadic acid, ammonium salt	7803556	Ammonium vanadate	1*	4	P119	C	1000 (454)
** Vanadium(V) oxide	1314621	Vanadium pentoxide	1000	1,4	P120	C	1000## (454)
** Vanadium pentoxide	1314621	Vanadium(V) oxide	1000	1,4	P120	C	1000## (454)
** Vanadyl sulfate	27774136		1000	1		C	1000## (454)
* Vinyl acetate	108054		1000	1		D	5000 (2270)
* Vinyl chloride	75014	Ethene, chloro-	1*	2,3,4	U043	X	1# (0.454)
* Vinylidene chloride	75354	1,1-Dichloroethylene Ethene, 1,1-dichloro-	5000	1,2,4	U078	D	5000# (2270)
* Warfarin	81812	3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts.	1*	4	P001	B	100 (45.4)
Xylene (mixed)	1330207	Benzene,dimethyl	1000	1,4	U239	C	1000 (454)
m-	108383	m-					
o-	95476	o-					
** p-	106423	p-					
Xylenol	1300716		1000	1		C	1000 (454)
Yohimban-16-carboxylic acid,11,17-dimethoxy- 18-[(3,4,5- trimethoxybenzoyl)oxy]-, methylester	50555	Reserpine	1*	4	U200	D	5000 (2270)
Zinc ††	7440666		1*	2		X	1## (0.454)
ZINC AND COMPOUNDS			1*	2			**
** Zinc acetate	557346		1000	1		C	1000## (454)
** Zinc ammonium chloride	52628258 14639975 14639986		5000	1		D	5000## (2270)
** Zinc borate	1332076		1000	1		C	1000## (454)
** Zinc bromide	7699458		5000	1		D	5000## (2270)
** Zinc carbonate	3486359		1000	1		C	1000## (454)
* Zinc chloride	7646857		5000	1		D	5000## (2270)
* Zinc cyanide	557211		10	1,4	P121	A	10## (4.54)
** Zinc fluoride	7783495		1000	1		C	1000## (454)
** Zinc formate	557415		1000	1		C	1000## (454)
** Zinc hydrosulfite	7779864		1000	1		C	1000## (454)
** Zinc nitrate	7779886		5000	1		D	5000## (2270)
** Zinc phenolsulfonate	127822		5000	1		D	5000## (2270)
** Zinc phosphide	1314847		1000	1,4	P122	C	1000## (454)
** Zinc silicofluoride	16871719		5000	1		D	5000##(2270)
** Zinc sulfate	7733020		1000	1		C	1000## (454)
** Zirconium nitrate	13746899		5000	1		D	5000 (2270)
** Zirconium potassium fluoride	16923958		5000	1		C	1000 (454)
** Zirconium sulfate	14644612		5000	1		D	5000 (2270)
** Zirconium tetrachloride	10026116		5000	1		D	5000 (2270)
F001			1*	4	F001	X	1# (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
The following spent halogenated solvents used in degreasing and sludges from the recovery of these solvents in degreasing operations:							
(a) Tetrachloroethylene	127184					X	1# (0.454)
(b) Trichloroethylene	79016					C	1000# (454)
(c) Methylene chloride	75092					C	1000 (454)
(d) 1,1,1-Trichloroethane	71556					C	1000 (454)
(e) Carbon tetrachloride	56235					D	5000# (2270)
(f) Chlorinated fluorocarbons	(N.A.)					D	5000 (2270)
F002			1*	4	F002	X	1# (0.454)
The following spent halogenated solvents and the still bottoms from the recovery of these solvents:							
(a) Tetrachloroethylene	127184					X	1# (0.454)
(b) Methylene Chloride	75092					C	1000 (454)
(c) Trichloroethylene	79016					C	1000# (454)
(d) 1,1,1-Trichloroethane	71556					C	1000 (454)
(e) Chlorobenzene	108907					B	100 (45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane	76131					D	5000 (2270)
(g) o-Dichlorobenzene	106467					B	100 (45.4)
(h) Trichlorofluoromethane	75694					D	5000 (2270)
F003			1*	4	F003	B	100 (45.4)
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:							
(a) Xylene	1330207					C	1000 (454)
(b) Acetone	67641					D	5000 (2270)
(c) Ethyl acetate	141786					D	5000 (2270)
(d) Ethylbenzene	100414					C	1000 (454)
(e) Ethyl ether	60297					B	100 (45.4)
(f) Methyl isobutyl ketone	108101					D	5000 (2270)
(g) n-Butyl alcohol	71363					D	5000 (2270)
(h) Cyclohexanone	108941					D	5000 (2270)
(i) Methanol	67561					D	5000 (2270)
F004			1*	4	F004	X	1## (0.454)
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:							
(a) Cresols/Cresylic acid	1319773					C	1000# (454)
(b) Nitrobenzene	98953					C	1000 (454)
F005			1*	4	F005	X	1## (0.454)
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:							
(a) Toluene	108883					C	1000 (454)
(b) Methyl ethyl ketone	78933					D	5000 (2270)
(c) Carbon disulfide	75150					D	5000# (2270)
(d) Isobutanol	78831					D	5000 (2270)
(e) Pyridine	110861					X	1## (0.454)
F006			1*	4	F006	X	1# (0.454)
Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum							
F007			1*	4	F007	A	10 (4.54)
Spent cyanide plating bath solutions from electroplating operations (except for precious metals electroplating spent cyanide plating bath solutions)							
F008			1*	4	F008	A	10 (4.54)
Plating bath sludges from the bottom of plating baths from electroplating operations where cyanides are used in the process (except for precious metals electroplating plating bath sludges)							
F009			1*	4	F009	A	10 (4.54)
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process (except for precious metals electroplating spent stripping and cleaning bath solutions)							
F010			1*	4	F010	A	10 (4.54)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds (Kg)
Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process (except for precious metals heat-treating quenching bath sludges)							
F011 Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning)			1*	4	F011	A	10 (4.54)
F012 Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process (except for precious metals heat treating quenching wastewater treatment sludges)			1*	4	F012	A	10 (4.54)
F019 Wastewater treatment sludges from the chemical conversion coating of aluminum			1*	4	F019	X	1# (0.454)
F024 Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout wastes, from the production of chlorinated aliphatic hydrocarbons,having carbon content from one to five, utilizing free radical catalyzed processes. (This listing does not include light ends, spent filters and filter aids, spent dessicants(sic), wastewater, wastewater treatment sludges, spent catalysts,and wastes listed in Section 261.32.)			1*	4	F024	X	1# (0.454)
K001 Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol			1*	4	K001	X	1# (0.454)
K002 Wastewater treatment sludge from the production of chrome yellow and orange pigments			1*	4	K002	X	1# (0.454)
K003 Wastewater treatment sludge from the production of molybdate orange pigments			1*	4	K003	X	1# (0.454)
K004 Wastewater treatment sludge from the production of zinc yellow pigments			1*	4	K004	X	1# (0.454)
K005 Wastewater treatment sludge from the production of chrome green pigments			1*	4	K005	X	1# (0.454)
K006 Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated)			1*	4	K006	X	1# (0.454)
K007 Wastewater treatment sludge from the production of iron blue pigments			1*	4	K007	X	1# (0.454)
K008 Oven residue from the production of chrome oxide green pigments			1*	4	K008	X	1# (0.454)
K009 Distillation bottoms from the production of acetaldehyde from ethylene			1*	4	K009	X	1# (0.454)
K010 Distillation side cuts from the production of acetaldehyde from ethylene			1*	4	K010	X	1# (0.454)
K011 Bottom stream from the wastewater stripper in the production of acrylonitrile			1*	4	K011	X	1# (0.454)
K013 Bottom stream from the acetonitrile column in the production of acrylonitrile			1*	4	K013	X	1# (0.454)
K014 Bottoms from the acetonitrile purification column in the production of acrylonitrile			1*	4	K014	D	5000 (2270)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
K015 Still bottoms from thedistillation of benzyl chloride			1*	4	K015	X	1# (0.454)
K016 Heavy ends or distillation residues from the productionol carbon tetrachloride			1*	4	K016	X	1# (0.454)
K017 Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin			1*	4	K017	X	1# (0.454)
K018 Heavy ends from the fractionation column in ethyl chloride production			1*	4	K018	X	1# (0.454)
K019 Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production			1*	4	K019	X	1# (0.454)
K020 Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production			1*	4	K020	X	1# (0.454)
K021 Aqueous spent antimony catalyst waste from fluoromethanes production			1*	4	K021	X	1# (0.454)
K022 Distillation bottom tars from the production of phenol/acetone from cumene			1*	4	K022	X	1# (0.454)
K023 Distillation light ends from the production of phthalic anhydride from naphthalene			1*	4	K023	[illegible]	5000 (2[illegible]
K024 Distillation bottoms from the production of phthalic anhydride from naphthalene			1*	4	K024	D	5000 (2270)
K025 Distillation bottoms from the production of nitrobenzene by the nitration of benzene			1*	4	K025	X	1# (0.454)
K026 Stripping still tails from the production of methyl ethyl pyridines			1*	4	K026	X	1## (0.454)
K027 Centrifuge and distillation residues from toluene diisocyanate production			1*	4	K027	X	1# (0.454)
K028 Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane			1*	4	K028	X	1# (0.454)
K029 Waste from the product steam stripper in the production of 1,1,1-trichloroethane			1*	4	K029	X	1# (0.454)
K030 Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene			1*	4	K030	X	1# (0.454)
K031 By-product salts generated in the production of MSMA and cacodylic acid			1*	4	K031	X	1# (0.454)
K032 Wastewater treatment sludge from the production of chlordane			1*	4	K032	X	1# (0.454)
K033 Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane			1*	4	K033	X	1# (0.454)
K034 Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane			1*	4	K034	X	1# (0.454)
K035 Wastewater treatment sludges generated in the production of creosote			1*	4	K035	X	1# (0.454)
K036			1*	4	K036	X	1 (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
Still bottoms from toluene reclamation distillation in the production of disulfoton							
K037 Wastewater treatment sludges from the production of disulfoton			1*	4	K037	X	1 (0.454)
K038 Wastewater from the washing and stripping of phorate production			1*	4	K038	X	1# (0.454)
K039 Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate			1*	4	K039	X	1## (0.454)
K040 Wastewater treatment sludge from the production of phorate			1*	4	K040	X	1# (0.454)
K041 Wastewater treatment sludge from the production of toxaphene			1*	4	K041	X	1# (0.454)
K042 Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T			1*	4	K042	X	1# (0.454)
K043 2,6-Dichlorophenol waste from the production of 2,4-D			1*	4	K043	X	1# (0.454)
K044 Wastewater treatment sludges from the manufacturing and processing of explosives			1*	4	K044	A	10 (4.54)
K045 Spent carbon from the treatment of wastewater containing explosives			1*	4	K045	A	10 (4.54)
K046 Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds			1*	4	K046	X	1## (0.454)
K047 Pink/red water from TNT operations			1*	4	K047	A	10 (4.54)
K048 Dissolved air flotation (DAF) float from the petroleum refining industry			1*	4	K048	X	1# (0.454)
K049 Slop oil emulsion solids from the petroleum refining industry			1*	4	K049	X	1# (0.454)
K050 Heat exchanger bundle cleaning sludge from the petroleum refining industry			1*	4	K050	X	1# (0.454)
K051 API separator sludge from the petroleum refining industry			1*	4	K051	X	1# (0.454)
K052 Tank bottoms (leaded) from the petroleum refining industry			1*	4	K052	X	1## (0.454)
K060 Ammonia still lime sludge from coking operations			1*	4	K060	X	1# (0.454)
K061 Emission control dust/sludge from the primary production of steel in electric furnaces			1*	4	K061	X	1# (0.454)
K062 Spent pickle liquor from steel finishing operations			1*	4	K062	X	1# (0.454)
K069 Emission control dust/sludge from secondary lead smelting			1*	4	K069	X	1# (0.454)
K071 Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used			1*	4	K071	X	1 (0.454)

TABLE 302.4 - LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds(Kg)
K073 Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production			1*	4	K073	X	1# (0.454)
K083 Distillation bottoms from aniline extraction			1*	4	K083	B	100 (45.4)
K084 Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds			1*	4	K084	X	1# (0.454)
K085 Distillation or fractionation column bottoms from the production of chlorobenzenes			1*	4	K085	X	1# (0.454)
K086 Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead			1*	4	K086	X	1# (0.454)
K087 Decanter tank tar sludge from coking operations			1*	4	K087	X	1## (0.454)
K093 Distillation light ends from the production of phthalic anhydride from ortho-xylene			1*	4	K093	D	5000 (2270)
K094 Distillation bottoms from the production of phthalic anhydride from ortho-xylene			1*	4	K094	D	5000 (2270)
K095 Distillation bottoms from the production of 1,1,1-trichloroethane			1*	4	K095	X	1# (0.454)
K096 Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane			1*	4	K096	X	1# (0.454)
K097 Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane			1*	4	K097	X	1# (0.454)
K098 Untreated process wastewater from the production of toxaphene			1*	4	K098	X	1# (0.454)
K099 Untreated wastewater from the production of 2,4-D			1*	4	K099	X	1# (0.454)
K100 Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting (Components of this waste are identical with those of K069).			1*	4	K100	X	1# (0.454)
K101 Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds			1*	4	K101	X	1# (0.454)
K102 Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds			1*	4	K102	X	1# (0.454)
K103 Process residues from aniline extraction from the production of aniline			1*	4	K103	B	100 (45.4)
K104 Combined wastewater streams generated from nitrobenzene/aniline chlorobenzenes			1*	4	K104	X	1# (0.454)
K105 Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes			1*	4	K105	X	1# (0.454)
K106 Wastewater treatment sludge from the mercury cell process in chlorine production			1*	4	K106	X	1 (0.454)

See footnotes on following page.

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Lead arsenate	06210	7784409 7645252 10102484		5000	1			###
Lead chloride	06124	7758954		5000	1			##
Lead fluoborate	$	13814965		5000	1			##
Lead fluoride	$	7783462		1000	1			##
Lead iodide	$	10101630		5000	1			##
Lead nitrate	06240	10099748		5000	1			##
Lead phosphate		7446277	Phosphoric acid, lead salt	1*	4	U145		###
Lead stearate	$	7428480 1072351 56189094		5000	1			##
Lead subacetate		1335326		1*	4	U146		###
Lead sulfate	06246	15739807 7446142	Lead sulfate solid with [3% free acid	5000	1			##
Lead sulfide	$	1314870		5000	1			##
Lead thiocyanate	$	592870		5000	1			##
Lindane	06275	58899	gamma - BHC Hexachlorocyclohexane (gamma isomer)	1	1,2,4	U129	X	1(0.454)
Lithium chromate	$	14307358		1000	1			###
Malathion	06514	121755		10	1		B	100(45.4)
Maleic acid	$	110167		5000	1		D	5000(2270)
✓ Maleic anhydride	$	108316	2,5-Furandione	5000	1,4	U147	D	5000(2270)
Maleic hydrazide		123331	1,2-Dihydro-3,6-pyridazinedione	1*	4	U148	D	5000(2270)
Malononitrile		109773	Propanedinitrile	1*	4	U149	C	1000(454)
Melphalan		148823	Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L-	1*	4	U150		#

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Mercaptodimethur	§	2032657		100	1		A	10(4.54)
Mercuric cyanide	06620	592041		1	1		X	1(0.454)
Mercuric nitrate	§	10045940		10	1			##
Mercuric sulfate	06730	7783359		10	1			##
Mercuric thiocyanate	§	592858		10	1			##
Mercurous nitrate	06790	10415755 7782867		10	1			##
Mercury	06865	7439976	Mercury metallic	1*	2,3,4	U151	X	1(0.454)
MERCURY AND COMPOUNDS	06850		Mercury compound N.O.S. solid	1*	2			**
Mercury, (acetato-O)phenyl-		62384	Phenylmercuric acetate	1*	4	P092		##
Mercury fulminate		628864	Fulminic acid, mercury(II)salt	1*	4	P065		##
✓Methacrylonitrile		126987	2-Propenenitrile, 2-methyl-	1*	4	U152	C	1000(454)
Methanamine, N-methyl-	04240	124403	Dimethylamine, Dimethylamine anhydrous	1000	1,4	U092		##
Methane, bromo-	06970	74839	Methyl bromide	1*	2,4	U029	C	1000(454)
Methane, chloro-	06980	74873	Methyl chloride	1*	2,4	U045		##
Methane, chloromethoxy-		107302	Chloromethyl methyl ether	1*	4	U046		###
Methane, dibromo-		74953	Methylene bromide	1*	4	U068	C	1000(454)
Methane, dichloro-	04124	75092	Methylene chloride	1*	2,4	U080	C	1000(454)
Methane, dichlorodifluoro-	04060	75718	Dichlorodifluoromethane	1*	4	U075	D	5000(2270)
Methane, iodo-		74884	Methyl iodide	1*	4	U138		#
Methane, oxybis(chloro-		542881	Bis(chloromethyl) ether	1*	4	P016		###
Methane, tetrachloro-	02752	56235	Carbon tetrachloride	5000	1,2,4	U211		###
Methane, tetranitro-	10190	509148	Tetranitromethane	1*	4	P112	A	10(4.54)

CERCLA HAZARDOUS SUBSTANCES
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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
Methane, tribromo		75252	Bromoform	1*	2,4	U225	B	100(45.4)
Methane, trichloro-	03175	67663	Chloroform	5000	1,2,4	U044		#
Methane, trichlorofluoro-		75694	Trichloromonofluoromethane	1*	4	U121	D	5000(2270)
Methanesulfonic acid, ethyl ester		62500	Ethyl methanesulfonate	1*	4	U119		#
Methanethiol	07090	74931	Methylmercaptan	100	1,4	U153	B	100(45.4)
			Thiomethanol					
Methanesulfenyl chloride, trichloro		594423	Trichloromethanesulfenyl chloride	1*	4	P118	B	100(45.4)
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a, 4,7,7a-tetrahydro-	§	76448	Heptachlor	1	1,2,4	P059	X	1(0.454)
Methanoic acid	05190	64186	Formic acid	5000	1,4	U123	D	5000(2270)
4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4, 7,7a-tetrahydro-	03135	57749	Chlordane	1	1,2,4	U036	X	1(0.454)
			Chlordane, technical					
✓Methanol	03450	67561	Methyl alcohol,	1*	4	U154	D	5000(2270)
			Columbian spirits					
Methapyrilene		91805	Pyridine, 2-[(2-(dimethylamino)ethyl)-2-thenylamino]-	1*	4	U155	D	5000(2270)
Methomyl		16752775	Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester	1*	4	P066	C	1000(454)
Methoxychlor	§	72435	Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)	1	1,4	U247	X	1(0.454)
Methyl alcohol	03450	67561	Methanol,	1*	4	U154	D	5000(2270)
			Columbian spirits					
2-Methylaziridine	08790	75558	1,2-Propylenimine,	1*	4	P067		#
			Propyleneimine inhibited					
Methyl bromide	06970	74839	Methane, bromo-	1*	2,4	U029	C	1000(454)
1-Methylbutadiene		504609	1,3-Pentadiene	1*	4	U186	B	100(45.4)

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Methyl chloride	06980	74873	Methane, chloro-	1*	2,4	U045		##
Methyl chlorocarbonate		79221	Carbonochloridic acid, methyl ester	1*	4	U156	C	1000(454)
Methyl chloroform	06998	71556	1,1,1-Trichloroethane	1*	2,4	U226	C	1000(454)
4,4'-Methylenebis(2-chloroaniline)		101144	Benzenamine, 4,4'-methylenebis(2-chloro-	1*	4	U158		#
2,2'-Methylenebis(3,4,6-trichlorophenol)		70304	Hexachlorophene	1*	4	U132		##
3-Methylcholanthrene		56495	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	1*	4	U157		#
Methylene bromide		74953	Methane, dibromo-	1*	4	U068	C	1000(454)
Methylene chloride	04124	75092	Methane, dichloro-	1*	2,4	U080	C	1000(454)
Methylene oxide	05186 05187	50000	Formaldehyde	1000	1,4	U122		##
			Formaldehyde formlin solution [= 100 gal					
			Formaldehyde formlin solution _ 100 gal					
✓Methyl ethyl ketone	07040	78933	2-Butanone	1*	4	U159	C	1000(454)
Methyl ethyl ketone peroxide		1338234	2-Butanone peroxide	1*	4	U160	A	10(4.54)
Methyl hydrazine	07060	60344	Hydrazine, methyl-	1*	4	P068	A	10(4.54)
Methyl iodide		74884	Methane, iodo-	1*	4	U138		#
✓Methyl isobutyl ketone		108101	4-Methyl-2-pentanone	1*	4	U161	D	5000(2270)
Methyl isocyanate		624839	Isocyanic acid, methyl ester	1*	4	P064	B	100(45.4)
2-Methyllactonitrile	01020	75865	Acetone cyanohydrin	10	1,4	P069	A	10(4.54)
			Propanenitrile, 2-hydroxy-2-methyl-					
Methylmercaptan	07090	74931	Methanethiol	100	1,4	U153	B	100(45.4)
			Thiomethanol					
✓Methyl methacrylate	07105	80626	2-Propenoic acid, 2-methyl-, methyl ester	5000	1,4	U162	C	1000(454)
			Methyl methacrylate uninhibited					
N-Methyl-N'-nitro-N-nitrosoguanidine		70257	Guanidine, N-nitroso-N-methyl-N'-nitro-	1*	4	U163		#

CERCLA HAZARDOUS SUBSTANCES
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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
Methyl parathion	07110	298000	O,O-Dimethyl O-p-nitrophenyl phosphorothioate, Methylparathion liquid	100	1,4	P071		##
4-Methyl-2-pentanone		108101	Methyl isobutyl ketone	1*	4	U161	D	5000(2270)
Methylthiouracil		56042	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	1*	4	U164		#
Mevinphos	§	7786347		1	1		A	10(4.54)
Mexacarbate	§	315184		1000	1		C	1000(454)
Mitomycin C	50077	Azirino(7-dione, methyl)- methoxy-		1*	3,4	#		
Monoethylamine	07280	75047		1000	1			##
Monomethylamine	07300	74895		1000	1		B	100(45.4)
Naled	§	300765		10	1		A	10(4.54)
5,12-Naphthacenedione, (8s-cis)-8-acetyl-10-[3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxyl-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-		20830813	Daunomycin	1*	4	U059		#
✓ Naphthalene	07535	91203		5000	1,2,4	U165	B	100(45.4)
Naphthalene, 2-chloro-		91587	beta-Chloronaphthalene 2-Chloronaphthalene	1*	2,4	U047	D	5000(2270)
1,4-Naphthalenedione		130154	1,4-Naphthoquinone	1*	4	U166	D	5000(2270)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy) -tetrasodium salt		72571	Trypan blue	1*	4	U236		#
Naphthenic acid	¶	1338245		100	1		B	100(45.4)
1,4-Naphthoquinone		130154	1,4-Naphthalenedione	1*	4	U166	D	5000(2270)
1-Naphthylamine		134327	alpha-Naphthylamine	1*	4	U167		#

CERCLA HAZARDOUS SUBSTANCES
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				Statutory			Proposed RQ	
Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
2-Naphthylamine		91598	beta-Naphthylamine	1*	4	U168		#
alpha-Naphthylamine		134327	1-Naphthylamine	1*	4	U167		#
beta-Naphthylamine		91598	2-Naphthylamine	1*	4	U168		#
2-Naphthylamine, N,N-bis(2-chloroethyl)-		494031	Chlornaphazine	1*	4	U026		#
alpha-Naphthylthiourea		86884	Thiourea, 1-naphthalenyl-	1*	4	P072	B	100(45.4)
Nickel †	07590	7440020	Nickel catalyst wet	1*	2			###
NICKEL AND COMPOUNDS				1*	2			**
Nickel ammonium sulfate	$	15699180		5000	1			##
Nickel carbonyl	07580	13463393	Nickel tetracarbonyl	1*	4	P073		###
Nickel chloride	$	7718549 37211055		5000	1			##
Nickel cyanide	07600	557197	Nickel(II) cyanide	1*	4	P074	A	10(4.54)
Nickel(II) cyanide	07600	557197	Nickel cyanide	1*	4	P074	A	10(4.54)
Nickel hydroxide	$	12054487		1000	1			###
Nickel nitrate	$	14216752		5000	1			##
Nickel sulfate	$	7786814		5000	1			##
Nickel tetracarbonyl	07580	13463393	Nickel carbonyl	1*	4	P073		###
Nicotine and salts	07620 07610 07630 07640 07650	54115	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts Nicotine liquid Nicotine hydrochloride Nicotine salicylate Nicotine sulfate liquid Nicotine suflate solid Nicotine tarrate	1*	4	P075	B	100(45.4)

CERCLA HAZARDOUS SUBSTANCES
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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
Nitric acid	07700	7697372		1000	1		C	1000(454)
Nitric oxide	07710	10102439	Nitrogen(II) oxide	1*	4	P076	A	10(4.54)
p-Nitroaniline	07715	100016	Benzenamine, 4-nitro- Nitroaniline	1*	4	P077	D	5000(2270)
Nitrobenzene	07720	98953	Benzene, nitro- Nitrobenzol	1000	1,2,4	U169	C	1000(454)
Nitrogen dioxide	07770	10102440	Nitrogen(IV) oxide	1000	1,4	P078	A	10(4.54)
Nitrogen(II) oxide	07710	10102439	Nitric oxide	1*	4	P076	A	10(4.54)
Nitrogen(IV) oxide	07770	10102440	Nitrogen dioxide	1000	1,4	P078	A	10(4.54)
Nitroglycerine		55630	1,2,3-Propanetriol, trinitrate-	1*	4	P081	A	10(4.54)
Nitrophenol (mixed)	¶	25154556		1000	1		B	100(45.4)
m-		554847						
o-		88755						
p-		100027						
p-Nitrophenol		100027	4-Nitrophenol Phenol, 4-nitro-	1*	2,4	U170	B	100(45.4)
2-Nitrophenol		88755		1*	2		B	100(45.4)
4-Nitrophenol		100027	p-Nitrophenol Phenol, 4-nitro-	1*	2,4	U170	B	100(45.4)
NITROPHENOLS				1*	2			**
2-Nitropropane		79469	Propane, 2-nitro-	1*	4	U171	C	1000(454)
NITROSAMINES				1*	2			**
N-Nitrosodi-n-butylamine		924163	1-Butanamine, N-butyl-N-nitroso-	1*	4	U172		#
N-Nitrosodiethanolamine		1116547	Ethanol, 2,2'-(nitrosoimino)bis-	1*	4	U173		#
N-Nitrosodiethylamine		55185	Ethanamine, N-ethyl-N-nitroso-	1*	4	U174		#

CERCLA HAZARDOUS SUBSTANCES
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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
N-Nitrosodimethylamine		62759	Dimethylnitrosamine	1*	2,4	P082		#
N-Nitrosodiphenylamine		86306		1*	2		B	100(45.4)
N-Nitrosodi-n-propylamine		621647	Di-n-propylnitrosamine	1*	2,4	U111		#
N-Nitroso-N-ethylurea		759739	Carbamide, N-ethyl-N-nitroso-	1*	4	U176		#
N-Nitroso-N-methylurea		684935	Carbamide, N-methyl-N-nitroso	1*	4	U177		#
N-Nitroso-N-methylurethane		615532	Carbamic acid, methylnitroso-, ethyl ester	1*	4	U178		#
N-Nitrosomethylvinylamine		4549400	Ethenamine, N-methyl-N-nitroso-	1*	4	P084		#
N-Nitrosopiperidine		100754	Pyridine, hexahydro-N-nitroso-	1*	4	U179		#
N-Nitrosopyrrolidine		930552	Pyrrole, tetrahydro-N-nitroso-	1*	4	U180		#
Nitrotoluene	§	1321126		1000	1		C	1000(454)
5-Nitro-o-toluidine		99558	Benzenamine, 2-methyl-5-nitro-	1*	4	U181		#
5-Norbornene-2,3-dimethanol, 1,4,5,6,7,7-hexachloro, cyclic sulfite	¶	115297	Endosulfan	1	1,2,4	P050	X	1(0.454)
Octamethylpyrophosphoramide		152169	Diphosphoramide, octamethyl-	1*	4	P085	B	100(45.4)
Osmium oxide		20816120	Osmium tetroxide	1*	4	P087	C	1000(454)
Osmium tetroxide		20816120	Osmium oxide	1*	4	P087	C	1000(454)
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid		145733	Endothall	1*	4	P088	C	1000(454)
1,2-Oxathiolane, 2,2-dioxide		1120714	1,3-Propane sultone	1*	4	U193		#
2H-1,3,2-Oxazaphosphorine, 2-[bis(2-chloroethyl)amino] tetrahydro-2-oxide		50180	Cyclophosphamide	1*	4	U058		#
Oxirane	04740	75218	Ethylene oxide	1*	4	U115	B	100(45.4)
Oxirane, 2-(chloromethyl)-	§	106898	1-Chloro-2,3-epoxypropane Epichlorohydrin	1000	1,4	U041		###

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
Paraformaldehyde	S	30525894		1000	1		C	1000(454)
Paraldehyde		123637	1,3,5-Trioxane, 2,4,6-trimethyl-	1*	4	U182	C	1000(454)
Parathion	08110	56382	Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester	1	1,4	P089	X	1(0.454)
Pentachlorobenzene		608935	Benzene, pentachloro-	1*	4	U183		##
Pentachloroethane		76017	Ethane, pentachloro-	1*	4	U184		##
Pentachloronitrobenzene		82688	Benzene, pentachloronitro-	1*	4	U185		###
Pentachlorophenol	S	87865	Phenol, pentachloro-	10	1,2,4	U242	X	1(0.454)
1,3-Pentadiene		504609	1-Methylbutadiene	1*	4	U186	B	100(45.4)
Phenacetin		62442	Acetamide, N-(4-ethoxyphenyl)-	1*	4	U187		#
Phenanthrene		85018		1*	2		D	5000(2270)
Phenol	02680	108952	Benzene, hydroxy- Carbolic acid solid	1000	1,2,4	U188		##
Phenol, 2-chloro-		95578	2-Chlorophenol o-Chlorophenol	1*	2,4	U048	B	100(45.4)
Phenol, 4-chloro-3-methyl-		59507	4-Chloro-m-cresol p-Chloro-m-cresol	1*	2,4	U039	D	5000(2270)
Phenol, 2-cyclohexyl-4,6-dinitro-	04354	131895	4,6-Dinitro-o-cyclohexylphenol Dinitrocyclohexyl phenol	1*	4	P034	B	100(45.4)
Phenol, 2,4-dichloro-		120832	2,4-Dichlorophenol	1*	2,4	U081	B	100(45.4)
	Pheno	87650	2,6-Dichlorophenol	1*	4	U082	B	1**(45.4)
Phenol, 2,4-dimethyl-		105679	2,4-Dimethylphenol	1*	2,4	U101	B	100(45.4)
Phenol, 2,4-dinitro-		51285	2,4-Dinitrophenol	1*	2,4	P048	B	100(45.4)
Phenol, 2,4-dinitro-6-(1-methylpropyl)-		88857	Dinoseb	1*	4	P020	C	1000(454)

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				Statutory			Proposed RQ	
Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Phenol 2,4-dinitro-6-methyl-, and salts		534521	4,6-Dinitro-o-cresol and salts	1*	2,4	P047	B	100(45.4)
Phenol, 4-nitro-		100027	p-Nitrophenol 4-Nitrophenol	1*	2,4	U170	B	100(45.4)
Phenol, pentachloro-	$	87865	Pentachlorophenol	10	1,2,4	U242	X	1(0.454)
Phenol, 2,3,4,6-tetrachloro-		58902	2,3,4,6-Tetrachlorophenol	1*	4	U212	A	10(4.54)
Phenol, 2,4,5-trichloro-		95954	2,4,5-Trichlorophenol	1*	4	U230		##
Phenol, 2,4,6-trichloro		88062	2,4,6-Trichlorophenol	1*	2,4	U231		###
Phenol, 2,4,6-trinitro-, ammonium salt	01420	131748	Ammonium picrate Ammonium picrate wet	1*	4	P009	A	10(4.54)
Phenyl dichloroarsine		696286	Dichlorophenylarsine	1*	4	P036		###
1,10-(1,2-Phenylene)pyrene		193395	Indeno(1,2,3-cd)pyrene	1*	2,4	U137		###
Phenylmercuric acetate		62384	Mercury, (acetato-O)phenyl-	1*	4	P092		##
N-Phenylthiourea		103855	Thiourea, phenyl-	1*	4	P093	B	100(45.4)
Phorate		298022	Phosphorodithioic acid, O,O-diethyl S-(ethylthio) methyl ester	1*	4	P094		##
Phosgene	08360	75445	Carbonyl chloride	5000	1,4	P095	C	1000(454)
Phosphine	08362	7803512	Hydrogen phosphide	1*	4	P096	B	100(45.4)
Phosphoric acid	08365	7664382		5000	1		D	5000(2270)
Phosphoric acid, diethyl p-nitrophenyl ester		311455	Diethyl-p-nitrophenyl phosphate	1*	4	P041	B	100(45.4)
Phosphoric acid, lead salt		7446277	Lead phosphate	1*	4	U145		###
Phosphorodithioic acid, O,O-diethyl S-methyl ester		3288582	O,O-Diethyl S-Methyl Dithiophosphate	1*	4	U087	D	5000(2270)
Phosphorodithioic acid, O,O-diethyl S-(ethylthio) methyl ester		298022	Phorate	1*	4	P094		##

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				Statutory			Proposed RQ	
Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Phosphorodithioic acid, O,O-dimethyl S-[2(methylamino) -2-oxoethyl] ester		60515	Dimethoate	1*	4	P044	A	10(4.54)
Phosphorofluoridic acid, bis(1-methylethyl) ester		55914	Diisopropyl fluorophosphate	1*	4	P043	B	100(45.4)
Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester	08110*	56382	Parathion	1	1,4	P089	X	1(0.454)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester		297972	O,O-Diethyl O-pyrazinyl phosphorothioate	1*	4	P040	B	100(45.4)
Phosphorothioic acid, O,O-dimethyl O-[p-(dimethylamino)-sulfonyl) phenyl] ester		52857	Famphur	1*	4	P097	C	1000(454)
Phosphorus	08380	7723140	Phosphorus amorphous	1	1		X	1(0.454)
Phosphorus oxychloride	08400	10025873		5000	1		C	1000(454)
Phosphorus pentasulfide	08415	1314803	Phosphorus sulfide Sulfur phosphide	100	1,4	U189	B	100(45.4)
Phosphorus sulfide	58415	1314803	Phosphorus pentasulfide Sulfur phosphide	100	1,4	U189	B	100(45.4)
✓Phosphorus trichloride	08440	7719122		5000	1		C	1000(454)
PHTHALATE ESTERS				1*	2			**
Phthalic anhydride		85449	1,2-Benzenedicarboxylic acid anhydride	1*	4	U190	D	5000(2270)
2-Picoline		109068	Pyridine, 2-methyl-	1*	4	U191	D	5000(2270)
Plumbane, tetraethyl-	10130	78002	Tetraethyl lead	100	1,4	P110		##
POLYCHLORINATED BIPHENYLS (PCBs)	08575	1336363		10	1,2		X	1(0.454)
POLYNUCLEAR AROMATIC HYDROCARBONS				1*	2			**
Potassium arsenate	08590	7784410		1000	1			###
Potassium arsenite	08600	10124502		1000	1			###

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Potassium bichromate	08622	7778509		1000	1			###
Potassium chromate	§	7789006		1000	1			###
✓Potassium cyanide	03840	151508	Potassium cyanide solid	10	1,4	P098	A	10(4.54)
Potassium hydroxide	05826	1310583	Potassium hydroxine liquid or solution	1000	1		C	1000(454)
Potassium permanganate	08250	7722647		100	1		B	100(45.4)
Potassium silver cyanide		506616		1*	4	P099	X	1(0.454)
Pronamide		23950585	3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide	1*	4	U192	D	5000(2270)
1-Propanal, 2,3-epoxy-		765344	Glycidylaldehyde	1*	4	U126		#
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime		116063	Aldicarb	1*	4	P070	A	10(4.54)
1-Propanamine	08769	107108	n-Propylamine	1*	4	U194	D	5000(2270)
1-Propanamine, N-propyl-		142847	Dipropylamine	1*	4	U110	D	5000(2270)
Propane, 1,2-dibromo-3-chloro-		96128	1,2-Dibromo-3-chloropropane	1*	4	U066		#
Propane, 2-nitro-		79469	2-Nitropropane	1*	4	U171	C	1000(454)
Propane, 2,2'-oxybis[2-chloro-		108601	Bis(2-chloroisopropyl) ether	1*	2,4	U027	C	1000(454)
1,3-Propane sultone		1120714	1,2-Oxathiolane, 2,2-dioxide	1*	4	U193		#
Propanedinitrile		109773	Malononitrile	1*	4	U149	C	1000(454)
Propanenitrile		107120	Ethyl cyanide	1*	4	P101	A	10(4.54)
Propanenitrile, 3-chloro-		542767	3-Chloropropionitrile	1*	4	P027	C	1000(454)
Propanenitrile, 2-hydroxy-2-methyl-	01020	75865	Acetone cyanohydrin	10	1,4	P069	A	10(4.54)
			2-Methyllactonitrile					
1,2,3-Propanetriol, trinitrate-		55630	Nitroglycerine	1*	4	P081	A	10(4.54)
1-Propanol, 2,3-dibromo-, phosphate (3:1)		126727	Tris(2,3-dibromopropyl) phosphate	1*	4	U235		#
1-Propanol, 2-methyl-		78831	Isobutyl alcohol	1*	4	U140	D	5000(2270)

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
2-Propanone	01010	67641	Acetone	1*	4	U002	D	5000(2270)
2-Propanone, 1-bromo-	02370	598312	Bromoacetone	1*	4	P017	C	1000(454)
Propargite	§	2312358		10	1		A	10(4.54)
Propargyl alcohol		107197	2-Propyn-1-ol	1*	4	P102	C	1000(454)
2-Propenal	01130	107028	Acrolein Acrolein inhibited	1	1,2,4	P003	X	1(0.454)
2-Propenamide		79061	Acrylamide	1*	4	U007	D	5000(2270)
Propene, 1,3-dichloro-		542756	1,3-Dichloropropene	1*	2,4	U084	B	100(45.4)
1-Propene, 1,1,2,3,3,3-hexachloro-		1888717	Hexachloropropene	1*	4	U243	C	1000(454)
2-Propenenitrile	01140	107131	Acrylonitrile	100	1,2,4	U009		###
2-Propenenitrile, 2-methyl-		126987	Methacrylonitrile	1*	4	U152	C	1000(454)
2-Propenoic acid	01132	79107	Acrylic acid	1*	4	U008	D	5000(2270)
2-Propenoic acid, ethyl ester	04601	140885	Ethyl acrylate Ethyl acrylate inhibited	1*	4	U113	D	5000(2270)
2-Propenoic acid, 2-methyl-, ethyl ester		97632	Ethyl methacrylate	1*	4	U118	C	1000(454)
2-Propenoic acid, 2-methyl-, methyl ester	07150	80626	Methyl methacrylate	5000	1,4	U162	C	1000(454)
2-Propen-1-ol	01200	107186	Allyl alcohol	100	1,4	P005	B	100(45.4)
Propionic acid	08766	79094		5000	1		D	5000(2270)
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	§	93721	Silvex 2,4,5-TP acid	100	1,4	U233	B	100(45.4)
Propionic anhydride	08767	123626		5000	1		D	5000(2270)
n-Propylamine	08769	107108	1-Propanamine Propylamine	1*	4	U194	D	5000(2270)
Propylene dichloride	08783	78875	1,2-Dichloropropane	1*	2,4	U083	C	1000(454)

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
Propylene oxide	08800	75569		5000	1		B	100(45.4)
1,2-Propylenimine	08790	75558	2-Methylaziridine Proyleneimine inhibited	1*	4	P067		#
2-Propyn-1-ol		107197	Propargyl alcohol	1*	4	P102	C	1000(454)
Pyrene		129000		1*	2		D	5000(2270)
Pyrethrins	§	121299 121211		1000	1		C	1000(454)
4-Pyridinamine		504245	4-Aminopyridine	1*	4	P008	C	1000(454)
Pyridine	08810	110861		1*	4	U196		##
Pyridine, 2-[(2-(dimethylamino)ethyl)-2-thenylamino]-		91805	Methapyrilene	1*	4	U155	D	5000(2270)
Pyridine, hexahydro-N-nitroso-		100754	N-Nitrosopiperidine	1*	4	U179		#
Pyridine, 2-methyl-		109068	2-Picoline	1*	4	U191	D	5000(2270)
Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts	07320	54115	Nicotine and salts Nicotine liquid	1*	4	P075	B	100(45.4)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-		56042	Methylthiouracil	1*	4	U164		#
Pyrophosphoric acid, tetraethyl ester	10150 10160 10170	107493	Tetraethyl pyrophosphate Tetraethylpyrophosphate liquid Tetraethylpyrophosphate mixture dry Tetraethylpyrophosphate mixture liquid	100	1,4	P111		##
Pyrrole, tetrahydro-N-nitroso-		930552	N-Nitrosopyrrolidine	1*	4	U180		#
Quinoline	02100	91225	Benzine	1000	1		D	5000(2270)

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
RADIONUCLIDES	08920 08930 08940 08950		Radioactive material low specific activity N.O.S. Radioactive material N.O.S. Radioactive material limited quantity N.O.S. Radioactive material special form N.O.S.	1*	3			####
Reserpine		50555	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester	1*	4	U200	D	5000(2270)
Resorcinol	$	108463	1,3-Benzenediol	1000	1,4	U201	D	5000(2270)
Saccharin and salts		81072	1,2-Benzisothiazolin-3-one, 1,1-dioxide, and salts	1*	4	U202		#
Safrole		94597	Benzene, 1,2-methylenedioxy-4-allyl-	1*	4	U203		#
Selenious acid		7783008		1*	4	U204		##
Selenium †		7782492		1*	2			##
SELENIUM AND COMPOUNDS				1*	2			**
Selenium dioxide	$	7446084	Selenium oxide	1000	1,4	U204		##
Selenium disulfide		7488564	Sulfur selenide	1*	4	U205		##
Selenium oxide	$	7446084	Selenium dioxide	1000	1,4	U204		##
Selenourea		630104	Carbamimidoselenoic acid	1*	4	P103		##
L-Serine, diazoacetate (ester)		115026	Azaserine	1*	4	U015		#
Silver †		7440224		1*	2		C	1000(454)
SILVER AND COMPOUNDS				1*	2			**
Silver cyanide	09330	506649		1*	4	P104	X	1(0.454)
Silver nitrate	09340	7761888		1	1		X	1(0.454)
Silvex	$	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)- 2,4,5-TP acid	100	1,4	U233	B	100(45.4)

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Sodium	09580	7440235	Sodium metal	1000	1		A	10(4.54)
Sodium arsenate	09480	7631892		1000	1			###
Sodium arsenite	09490	7784465	Sodium arsenite liquid	1000	1			###
Sodium azide	09470	26628228		1*	4	P105	C	1000(454)
Sodium bichromate	09552	10588019	Sodium dichromate	1000	1			###
Sodium bifluoride	S	1333831		5000	1			##
Sodium bisulfite	09570	7631905	Sodium hydrosulfite	5000	1		D	5000(2270)
Sodium chromate	S	7775113		1000	1			###
✓Sodium cyanide	03860	143339	Sodium cyanide solid	10	1,4	P106	A	10(4.54)
Sodium dodecylbenzene sulfonate	S	25155300		1000	1		C	1000(454)
Sodium fluoride	09557	7681494		5000	1		C	1000(454)
Sodium hydrosulfide	S	16721805		5000	1		D	5000(2270)
✓Sodium hydroxide	09574	1310732		1000	1		C	1000(454)
Sodium hypochlorite	S	7681529 10022705		100	1		B	100(45.4)
Sodium methylate	09610	124414		1000	1		C	1000(454)
Sodium nitrite	09640	7632000		100	1			##
Sodium phosphate, dibasic	S	7558794 10039324 10028247 10140655		5000	1		D	5000(2270)
Sodium phosphate, tribasic	S	7601549 7785844 10101890 10361894 7758294 10124568		5000	1		D	5000(2270)
Sodium selenite	S	10102188 7782823		1000	1			##

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
4,4'-Stilbenediol, alpha,alpha'-diethyl-		56531	Diethylstilbestrol	1*	4	U089		#
Streptozotocin		18883664	D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	1*	4	U206		#
Strontium chromate	§	7789062		1000	1			#
Strontium sulfide		1314961		1*	4	P107	B	100(45.4)
Strychnidin-10-one, and salts	09872	57249	Strychnine and salts	10	1,4	P108	A	10(4.54)
Strychnidin-10-one, 2,3-dimethoxy-	02420	357573	Brucine	1*	4	P018	A	10(4.54)
Strychnine and salts	09872	57249	Strychnidin-10-one, and salts	10	1,4	P108	A	10(4.54)
✓Styrene	09874	100425	Styrene monomer inhibited	1000	1		C	1000(454)
Sulfur hydride	05860	7783064	Hydrogen sulfide	100	1,4	U135		##
Sulfur monochloride	09890	12771083	Sulfur chloride	1000	1		C	1000(454)
Sulfur phosphide	08415	1314803	Phosphorus pentasulfide Phosphorus sulfide	100	1,4	U189	B	100(45.4)
Sulfur selenide		7488564	Selenium disulfide	1*	4	U205		##
Sulfuric acid	09930	7664939		1000	1		C	1000(454)
Sulfuric acid, dimethyl ester	04310	77781	Dimethyl sulfate	1*	4	U103		#
Sulfuric acid, thallium(I) salt	10220	7446186	Thallium(I) sulfate Thallium sulfate, solid	1000	1,4	P115		##
2,4,5-T	§	93765	2,4,5-T acid 2,4,5-Trichlorophenoxyacetic acid	100	1,4	U232	B	100(45.4)
2,4,5-T acid	§	93765	2,4,5-T 2,4,5-Trichlorophenoxyacetic acid	100	1,4	U232	B	100(45.4)
2,4,5-T amines	§	2008460		100	1		B	100(45.4)

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
2,4,5-T esters	§	93798 2545597 61792072 1928478 25168154		100	1		B	100(45.4)
2,4,5-T salts	§	13560991		100	1		B	100(45.4)
TDE	§	72548	DDD	1	1,2,4	U060	X	1(0.454)
			4,4' DDD					
			Dichloro diphenyl dichloroethane					
1,2,4,5-Tetrachlorobenzene		95943	Benzene, 1,2,4,5-tetrachloro-	1*	4	U207	D	5000(2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)		1746016		1*	2		X	1(0.454)
1,1,1,2-Tetrachloroethane		630206	Ethane, 1,1,1,2-tetrachloro-	1*	4	U208		###
1,1,2,2-Tetrachloroethane	10087	79345	Ethane, 1,1,2,2-tetrachloro-	1*	2,4	U209		###
			Tetrachloroethane					
Tetrachloroethylene	10088	127184	Ethene, 1,1,2,2-tetrachloro-	1*	2,4	U210		###
2,3,4,6-Tetrachlorophenol		58902	Phenol, 2,3,4,6-tetrachloro-	1*	4	U212	A	10(4.54)
Tetraethyldithiopyrophosphate	10100	3689245	Dithiopyrophosphoric acid, tetraethyl ester	1*	4	P109	B	100(45.4)
			Tetraethyl dithio pyrophosphate					
Tetraethyl lead	10130	78002	Plumbane, tetraethyl-	100	1,4	P110		##
Tetraethyl pyrophosphate	§	107493	Pyrophosphoric acid, tetraethyl ester	100	1,4	P111		##
Tetrahydrofuran	10184	109999	Furan, tetrahydro-	1*	4	U213	C	1000(454)
Tetranitromethane	10190	509148	Methane, tetranitro-	1*	4	P112	A	10(4.54)
Tetraphosphoric acid, hexaethyl ester	05520	757584	Hexaethyl tetraphosphate	1*	4	P062	B	100(45.4)
Thallic oxide		1314325	Thallium(III) oxide	1*	4	P113		##
Thallium †		7440280		1*	2			##

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Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
THALLIUM AND COMPOUNDS	10210			1*	2			**
Thallium(I) acetate	10210	563688	Acetic acid, thallium(I) salt Thallium salts solid NOS	1*	4	U214		##
Thallium(I) carbonate	10210	6533739	Carbonic acid, dithallium (I) salt Thallium salts solid NOS	1*	4	U215		##
Thallium(I) chloride		7791120		1*	4	U216		##
Thallium(I) nitrate		10102451		1*	4	U217		##
Thallium(III) oxide		1314325	Thallic oxide	1*	4	P113		##
Thallium(I) selenide		12039520		1*	4	P114		##
Thallium(I) sulfate	10220	7446186	Sulfuric acid, thallium(I) salt Thallium sulfate solid	1000	1,4	P115		##
Thioacetamide		62555	Ethanethioamide	1*	4	U218		#
Thiofanox		39196184	3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime	1*	4	P045	B	100(45.4)
Thioimidodicarbonic diamide		541537	2,4-Dithiobiuret	1*	4	P049	B	100(45.4)
Thiomethanol	07090	74931	Methanethiol Methylmercaptan	100	1,4	U153	B	100(45.4)
Thiophenol		108985	Benzenethiol	1*	4	P014	B	100(45.4)
Thiosemicarbazide		79196	Hydrazinecarbothioamide	1*	4	P116	B	100(45.4)
Thiourea		62566	Carbamide, thio-	1*	4	U219		#
Thiourea, (2-chlorophenyl)-		5344821	1-(o-Chlorophenyl)thiourea	1*	4	P026	B	100(45.4)
Thiourea, 1-naphthalenyl-		86884	alpha-Naphthylthiourea	1*	4	P072	B	100(45.4)
Thiourea, phenyl-		103855	N-Phenylthiourea	1*	4	P093	B	100(45.4)
Thiram	10254	137268	Bis(dimethylthiocarbamoyl) disulfide	1*	4	U244	A	10(4.54)

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				Statutory			Proposed RQ	
Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Toluene	10340	108883	Benzene, methyl-	1000	1,2,4	U220	C	1000(454)
Toluenediamine	10335	95807	Diaminotoluene	1*	4	U221		#
✓Toluene diisocyanate	10336	584849	Benzene, 1,3-diisocyanatomethyl-	1*	4	U223	B	100(45.4)
o-Toluidine hydrochloride		636215	Benzenamine, 2-methyl-, hydrochloride	1*	4	U222		#
Toxaphene	§	8001352	Camphene, octachloro-	1	1,2,4	P123	X	1(0.454)
2,4,5-TP acid	§	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)-	100	1,4	U233	B	100(45.4)
			Silvex					
2,4,5-TP acid esters	§	32534955		100	1		B	100(45.4)
1H-1,2,4-Triazol-3-amine		61825	Amitrole	1*	4	U011		#
Trichlorfon	§	52686		1000	1			##
1,2,4-Trichlorobenzene		120821		1*	2		B	100(45.4)
1,1,1-Trichloroethane	06998	71556	Methyl chloroform	1*	2,4	U226	C	1000(454)
1,1,2-Trichloroethane		79005	Ethane, 1,1,2-trichloro-	1*	2,4	U227		###
Trichloroethene	10420	79016	Trichloroethylene	1000	1,2,4	U228		###
Trichloroethylene	10420	79016	Trichloroethene	1000	1,2,4	U228		###
Trichloromethanesulfenyl chloride		594423	Methanesulfenyl chloride, trichloro	1*	4	P118	B	100(45.4)
Trichloromonofluoromethane		75694	Methane, trichlorfluoro-	1*	4	U121	D	5000(2270)
Trichlorophenol	§	25167822		10	1			#
2,4,5-Trichlorophenol		95954	Phenol, 2,4,5-trichloro-	1*	4	U230		##
2,4,6-Trichlorophenol		88062	Phenol, 2,4,6-trichloro	1*	2,4	U231		###
2,4,5-Trichlorophenoxyacetic acid	§	93765	2,4,5-T	100	1,4	U232	B	100(45.4)
			2,4,5-T acid					
Triethanolamine dodecylbenzene sulfonate	§	27323417		1000	1		C	1000(454)

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Statutory and Proposed RQs

				Statutory			Proposed RQ	
Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
Triethylamine	§	121448		5000	1		D	5000(2270)
Trimethylamine	10480	75503		1000	1			##
sym-Trinitrobenzene	10520	99354	Benzene, 1,3,5-trinitro-	1*	4	U234		##
			Trinitrobenzene, wet					
1,3,5-Trioxane, 2,4,6-trimethyl-		123637	Paraldehyde	1*	4	U182	C	1000(454)
Tris(2,3-dibromopropyl) phosphate		126727	1-Propanol, 2,3-dibromo-, phosphate (3:1)	1*	4	U235		#
Trypan blue		72571	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	1*	4	U236		#
Unlisted Hazardous Wastes		(N.A.)		1*	4			
Characteristic of Ignitability				1*	4		B	100(45.4)
Characteristic of Corrosivity				1*	4		B	100(45.4)
Characteristic of Reactivity				1*	4		B	100(45.4)
Characteristic of EP Toxicity				1*	4			
Arsenic D004				1*	4			###
Barium D005				1*	4		C	1000(454)
Cadmium D006				1*	4			###
Chromium(VI) D007				1*	4			##
Lead D008				1*	4			##
Mercury D009				1*	4		X	1(0.454)
Selenium D010				1*	4			##
Silver D011				1*	4		X	1(0.454)
Endrin D012	§			1	1,4	P051	X	1(0.454)
Lindane D013	§			1	1,4	U129	X	1(0.454)

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
Methoxychlor D014	$			1	1,4	U247	X	1(0.454)
Toxaphene D015	$			1	1,4	P123	X	1(0.454)
2,4-D D016	$			100	1,4	U240	B	100(45.4)
2,4,5-TP D017	$			100	1,4	U233	B	100(45.4)
Uracil, 5-[bis(2-chloroethyl)amino]-		66751	Uracil mustard	1*	4	U237		#
Uracil mustard		66751	Uracil, 5-[bis(2-chloroethyl)amino]-	1*	4	U237		#
Uranyl acetate	$	541093		5000	1			##
Uranyl nitrate	10580	10102064 36478769		5000	1			##
Vanadic acid, ammonium salt		7803556	Ammonium vanadate	1*	4	P119	C	1000(454)
Vanadium(V) oxide	$	1314621	Vanadium pentoxide	1000	1,4	P120		##
Vanadium pentoxide	$	1314621	Vanadium(V) oxide	1000	1,4	P120		##
Vanadyl sulfate	$	27774136		1000	1			##
Vinyl acetate	10650	108054		1000	1		D	5000(2270)
Vinyl chloride	10660	75014	Ethene, chloro-	1*	2,3,4	U043		###
✓ Vinylidene chloride	04050	75354	1,1-Dichloroethylene Ethene, 1,1-dichloro- Dichloroethylene	5000	1,2,4	U078		###
Warfarin		81812	3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts	1*	4	P001	B	100(45.4)
✓ Xylene m- o- p-	10890	1330207 108383 95476 106423	Benzene, dimethyl m- o- p-	1000	1,4	U239	C	1000(454)
Xylenol	$	1300716		1000	1		C	1000(454)

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester		50555	Reserpine	1*	4	U200	D	5000(2270)
Zinc †		7440666		1*	2			##
ZINC AND COMPOUNDS				1*	2			**
Zinc acetate	$	557346		1000	1			##
Zinc ammonium chloride	$	52628258 14639975 14639986		5000	1			##
Zinc borate	$	1332076		1000	1			##
Zinc bromide	$	7699458		5000	1			##
Zinc carbonate	$	3486359		1000	1			##
Zinc chloride	10942	7646857	Zinc chloride solution	5000	1			##
Zinc cyanide	10950	557211		10	1,4	P121		##
Zinc fluoride	$	7783495		1000	1			##
Zinc formate	$	557415		1000	1			##
Zinc hydrosulfite	$	7779864		1000	1			##
Zinc nitrate	$	7779886		5000	1			##
Zinc phenolsulfonate	$	127822		5000	1			##
Zinc phosphide	$	1314847		1000	1,4	P122		##
Zinc silicofluoride	$	16871719		5000	1			##
Zinc sulfate	$	7733020		1000	1			##
Zirconium nitrate	$	13746899		5000	1		D	5000(2270)
Zirconium potassium fluoride	$	16923958		5000	1		C	1000(454)
Zirconium sulfate	$	14644612		5000	1		D	5000(2270)
Zirconium tetrachloride	$	10026116		5000	1		D	5000(2270)

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
F001 The following spent halogenated solvents used in degreasing and sludges from the recovery of these solvents in degreasing operations:				1*	4			###
(a) Tetrachlorethylene		127184						###
(b) Trichloroethylene		79016						###
(c) Methylene chloride		75092					C	1000(454)
(d) 1,1,1-Trichloroethane		71556					C	1000(454)
(e) Carbon tetrachloride		56235						###
(f) Chlorinated fluorocarbons		(N.A.)					D	5000(2270)
F002 The following spent halogenated solvents and the still bottoms from the recovery of these solvents:				1*	4			###
(a) Tetrachloroethylene		127184						###
(b) Methylene Chloride		75092					C	1000(454)
(c) Trichloroethylene		79016						###
(d) 1,1,1-Trichloroethane		71556					C	1000(454)
(e) Chlorobenzene		108907					B	100(45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane (76-13-1		76131					D	5000(2270)
(g) o-Dichlorobenzene		106467					B	100(45.4)
(h) Trichlorofluoromethane		75694					D	5000(2270)
F003 The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:				1*	4		B	100(45.4)
(a) Xylene		1330207					C	1000(454)
(b) Acetone		67641					D	5000(2270)
(c) Ethyl acetate		141786					D	5000(2270)
(d) Ethylbenzene		100414					C	1000(454)
(e) Ethyl ether		60297					B	100(45.4)
(f) Methyl isobutyl ketone		108101					D	5000(2270)
(g) n-Butyl alcohol		71363					D	5000(2270)
(h) Cyclohexanone		108941					D	5000(2270)
(i) Methanol		67561					D	5000(2270)
F004 The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:				1*	4			##
(a) Cresols/Cresylic acid		1319773						##
(b) Nitrobenzene		98953						##

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
F005 The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:				1*	4			##
(a) Toluene		108883					C	1000(454)
(b) Methyl ethyl ketone		78933					C	1000(454)
(c) Carbon disulfide		75150						##
(d) Isobutanol		78831					D	5000(2270)
(e) Pyridine		110861						##
F006 Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum				1*	4			###
F007 Spent cyanide plating bath solutions from electroplating operations (except for precious metals electroplating spent cyanide plating bath solutions)				1*	4		A	10(4.54)
F008 Plating bath sludges from the bottom of plating baths from electroplating operations where cyanides are used in the process (except for precious metals electroplating plating bath sludges)				1*	4		A	10(4.54)
F009 Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process (except for precious metals electroplating spent stripping and cleaning bath solutions)				1*	4		A	10(4.54)

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
F010 Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process (except for precious metals heat-treating quenching bath sludges)				1*	4		A	10(4.54)
F011 Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning)				1*	4		A	10(4.54)
F012 Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process (except for precious metals heat treating quenching wastewater teatment sludges)				1*	4		A	10(4.54)
F019 Wastewater treatment sludges from the chemical conversion coating of aluminum				1*	4			##
K001 Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol				1*	4		X	1(0.454)
K002 Wastewater treatment sludge from the production of chrome yellow and orange pigments				1*	4			##
K003 Wastewater treatment sludge from the production of molybdate orange pigments				1*	4			##
K004 Wastewater treatment sludge from the production of zinc yellow pigments				1*	4			##
K005 Wastewater treatment sludge from the production of chrome green pigments				1*	4			##

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
K006 Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated)				1*	4			##
K007 Wastewater treatment sludge from the production of iron blue pigments				1*	4			##
K008 Oven residue from the production of chrome oxide green pigments				1*	4			##
K009 Distillation bottoms from the production of acetaldehyde from ethylene				1*	4			###
K010 Distillation side cuts from the production of acetaldehyde from ethylene				1*	4			###
K011 Bottom stream from the wastewater stripper in the production of acrylonitrile				1*	4			###
K013 Bottom stream from the acetonitrile column in the production of acrylonitrile				1*	4			###
K014 Bottoms from the acetonitrile purification column in the production of acrylonitrile				1*	4			##
K015 Still bottoms from the distillation of benzyl chloride				1*	4			#
K016 Heavy ends or distillation residues from the production of carbon tetrachloride				1*	4			###
K017 Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin				1*	4			###
K018 Heavy ends from the fractionation column in ethyl chloride production				1*	4			###

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
K019 Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production				1*	4			###
K020 Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production				1*	4			###
K021 Aqueous spent antimony catalyst waste from fluoromethanes production				1*	4			###
K022 Distillation bottom tars from the production of phenol/acetone from cumene				1*	4			###
K023 Distillation light ends from the production of phthalic anhydride from naphthalene				1*	4		D	5000(2270)
K024 Distillation bottoms from the production of phthalic anhydride from naphthalene				1*	4		D	5000(2270)
K025 Distillation bottoms from the production of nitrobenzene by the nitration of benzene				1*	4		B	100(45.4)
K026 Stripping still tails from the production of methyl ethyl pyridines				1*	4			##
K027 Centrifuge and distillation residues from toluene diisocyanate production				1*	4			#
K028 Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane				1*	4			###
K029 Waste from the product steam stripper in the production of 1,1,1-trichloroethane				1*	4			###
K030 Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene				1*	4			###

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
K031 By-product salts generated in the production of MSMA and cacodylic acid				1*	4			###
K032 Wastewater treatment sludge from the production of chlordane				1*	4		X	1(0.454)
K033 Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane				1*	4		X	1(0.454)
K034 Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane				1*	4		X	1(0.454)
K035 Wastewater treatment sludges generated in the production of creosote				1*	4			###
K036 Still bottoms from toluene reclamation distillation in the production of disulfoton				1*	4		X	1(0.454)
K037 Wastewater treatment sludges from the production of disulfoton				1*	4		X	1(0.454)
K038 Wastewater from the washing and stripping of phorate production				1*	4			##
K039 Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate				1*	4			##
K040 Wastewater treatment sludge from the production of phorate				1*	4			##
K041 Wastewater treatment sludge from the production of toxaphene				1*	4		X	1(0.454)

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
K042 Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T				1*	4			###
K043 2,6-Dichlorophenol waste from the production of 2,4-D				1*	4			###
K044 Wastewater treatment sludges from the manufacturing and processing of explosives				1*	4		A	10(4.54)
K045 Spent carbon from the treatment of wastewater containing explosives				1*	4		A	10(4.54)
K046 Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds				1*	4			##
K047 Pink/red water from TNT operations				1*	4		A	10(4.54)
K048 Dissolved air flotation (DAF) float from the petroleum refining industry				1*	4			##
K049 Slop oil emulsion solids from the petroleum refining industry				1*	4			##
K050 Heat exchanger bundle cleaning sludge from the petroleum refining industry				1*	4			##
K051 API separator sludge from the petroleum refining industry				1*	4			##
K052 Tank bottoms (leaded) from the petroleum refining industry				1*	4			##
K060 Ammonia still lime sludge from coking operations				1*	4			###

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory RQ	Statutory Code ††	Statutory RCRA Waste Number	Proposed RQ Category	Proposed RQ Pounds(Kg)
K061 Emission control dust/sludge from the primary production of steel in electric furnaces				1*	4			###
K062 Spent pickle liquor from steel finishing operations				1*	4			##
K069 Emission control dust/sludge from secondary lead smelting				1*	4			###
K071 Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used				1*	4		X	1(0.454)
K073 Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production				1*	4			###
K083 Distillation bottoms from aniline extraction				1*	4			##
K084 Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds				1*	4			###
K085 Distillation or fractionation column bottoms from the productin of chlorobenzenes				1*	4			###
K086 Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead				1*	4			##
K087 Decanter tank tar sludge from coking operations				1*	4			##

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
K093 Distillation light ends from the production of phthalic anhydride from ortho-xylene				1*	4		D	5000(2270)
K094 Distillation bottoms from the production of phthalic anhydride from ortho-xylene				1*	4		D	5000(2270)
K095 Distillation bottoms from the production of 1,1,1-trichloroethane				1*	4			###
K096 Heavy ends from the heavy ends column from the production of a,a,a-trichloroethane 1,1,1				1*	4			###
K097 Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane				1*	4		X	1(0.454)
K098 Untreated process wastewater from the production of toxaphene				1*	4		X	1(0.454)
K099 Untreated wastewater from the production of 2,4-D				1*	4			###
K100 Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting. (Components of this waste are identical with those of K069)				1*	4			###
K101 Distillation tar residues form the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds				1*	4			###
K102 Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds				1*	4			###
K103 Process residues from aniline extraction from the production of aniline				1*	4			##

CERCLA HAZARDOUS SUBSTANCES
DOT Numbers and Names
Statutory and Proposed RQs

Hazardous Substance	DOT#	CAS No.	Regulatory Synonyms	Statutory			Proposed RQ	
				RQ	Code ††	RCRA Waste Number	Category	Pounds(Kg)
K104 Combined wastewater streams generated from nitrobenzene/aniline chlorobenzenes				1*	4			###
K105 Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes				1*	4			###
K106 Wastewater treatment sludge from the mercury cell process in chlorine production				1*	4		X	1(0.454)

* - indicates the CERCLA statutory 1 pound RQ for all hazardous substances designated under any of the statutory sources other than CWA Section 311 (including all hazardous wastes) and is not to be confused with a 1 pound RQ assigned under CWA section 311
†† - indicates the statutory source as defined by 1, 2, 3 or 4 below
1 - indicates the statutory source for designation of this substance under CERCLA is CWA Section 311(b)(4)
2 - indicates the statutory source for designation of this substance under CERCLA is CWA Section 307(a)
3 - indicates the statutory source for designation of this substance under CERCLA is CAA Section 112
4 - indicates the statutory source for designation of this substance under CERCLA is RCRA Section 3001
- indicates this substance is being assesed for carcinogenicity, statutory RQ applies
- indicates this substance is being assesed for other toxic effects, statutory RQ applies
- indicates this substance is being assesed for both carcinogenicity and other toxic effects, statutory RQ applies
- the agency will adjust the RQ for radionuclides in a future rulemaking, until that time the statutory 1 pound RQ is applicable
** - indicates no RQ is being assigned to generic or broad class
$ - indicates a CWA Section 311 hazardous substance that should be but was not on the TSC hazardous materials list

APPENDIX D

BOSTON AND MAINE RAILROAD - DETAILS OF HAZARDOUS CARGO MIX
1979 - 1981

	Number of Events 1981	 1980	 1979
Radioactive Material			
Articles or isotopes, N.E.C.	1	0	0
Containers	0	3	0
Cores	0	0	7
Metal alloy	0	0	1
Special solids	0	1	0
Explosive A			
Ammunition	2	0	0
Mercury fulminate (initiating explosive)	0	0	1
Explosive B			
Railway torpedoes	2	0	0
Explosive C			
Cartridges, small arms	0	1	2
Primers, cannon	1	0	0
Poison A			
Hydrocyanic acid	559	526	513
Flammable Gas			
Acetylene gas	0	1	0
Butadiene	0	2	20
Butane	3	8	1
Butene	4	15	0
Carbon monoxide	1	0	0
Dimethyl ether	2	0	1
Ethylene, liquid	1	3	1
Gas pintsh	0	0	1

	Number of Events		
	1981	1980	1979
Flammable Gas (Cont.)			
Hydrocarbon gas	12	5	0
Hydrogen sulfide	0	2	2
Isobutane	16	4	6
Dimethylamine	9	10	9
Liquefied pertroleum gas	3328	2832	2351
Methyl chloride	1	0	0
Methyl mercaptan	0	1	0
Trifluorochloroethylene	1	0	0
Vinyl chloride	6	32	7
Non-Flammable Gas			
Anyhdrous ammonia	164	162	194
Argon, liquid, pressurized	33	60	43
Argon (hydrogen gas mixture)	0	0	5
Boron trifluoride	0	1	0
Carbon dioxide	487	351	360
Chlorine	635	514	561
Fertilizer ammoniating solution	214	181	158
Fertilizer mfg. solution	14	25	0
Nitrogen gas	1	2	12
Sulfur dioxide	37	24	29
Flammable Liquid			
Acetone	0	0	1
Acrylonitrile	0	0	18
Alcohol, denatured	48	114	38
Amyl acetate	23	4	0

	Number of Events 1981	 1980	 1979
Flammable Liquid (Cont.)			
Amylenes penten	2	1	10
Benzene	0	0	1
Butyl alcohol	19	6	324
Carbon bisulfide	0	4	3
Cement, roofing	0	0	1
Compound, polishing liquid	3	0	8
Denatured alcohol solvent	2	0	0
Di-n-propylamine	0	1	0
Epichlorohydrin	1	1	8
Ethyl acetate	0	1	1
Ethyl acrylate	16	11	4
Ethyl alcohol	0	1	0
Ethyl alcohol, cologne spirits	376	219	37
Ethylene oxide	3	2	5
Ethyl ether	1	0	0
Ethyl-n-cyclohexylamine	0	1	0
Gasoline	9	6	2
Hexane	10	2	5
Isobutyl alcohol	9	9	2
Isobutyl aldehyde	1	0	0
Isobutyronitrile	0	1	0
Isopropyl acetate	40	22	0
Jet fuels	1	12	11
Lighter fluid	0	0	2
Methanol	26	23	17

	Number of Events 1981	 1980	 1979
Flammable Liquid (Cont.)			
Methyl ethyl	1	1	0
Methyl methacrylate monomer, inhibited	323	275	318
Petroleum propylene trimer	1	0	0
Pinene	2	6	0
Propyl alcohol	0	0	4
Propylene oxide	7	5	6
Spirits, alcohol	10	8	12
Spirits, grain	8	0	1
Styrene, liquid	2	3	4
Tetrahydrofuran	0	1	2
Toluene	0	0	3
Vinyl acetate	14	26	55
Vinylidene chloride, inhibited	0	0	3
Wine, sparkling (other than champagne)	15	21	0
Xylene	0	0	1
Oxidizer			
Ammonium nitrate	0	0	24
Ammonium nitrate fertilizer	31	35	9
Ammonium nitrate, sodium nitrate mixture	1	0	0
Calcium nitrate	4	6	8
Chlorinated lime	0	1	0
Fertilizing compounds	40	41	84
Hydrogen peroxide	15	15	4
Lead peroxide	0	0	2
Nitrate, N.O.S. (Nitrate of soda)	2	3	0

	Number of Events		
	1981	1980	1979
Oxidizer (Cont.)			
Potassium Chlorate	1	0	0
Potassium nitrate	1	3	0
Potassium perchlorate	0	0	4
Sodium chlorate	68	75	63
Sodium nitrate	49	33	40
Sodium nitrite	0	1	8
Flammable Solid			
Aluminum alloy powdered	0	0	1
Blood flour (tunkage)	15	56	137
Burnt cotton	3	21	142
Calcium carbide	23	32	39
Carbon, activated (charcoal)	5	5	5
Charcoal briquets	375	450	194
Charcoal, wood	20	14	12
Chromium resinate	0	0	1
Cotton, N.E.C. (burnt cotton, not repicked)	4	0	0
Cotton waste	34	43	45
Feed ground	1	1	0
Fibers (or) Fabric (not more than 5% oil)	2	3	11
Fish meal	21	76	34
Garbage tankage	0	0	1
Grain, spent	167	156	211
Iron, powdered	14	18	18
Matches	0	2	7
Metallic sodium	59	63	58

	Number of Events		
	1981	1980	1979
Flammable Solid (Cont.)			
Paper stock	0	2	1
Peanut chaff	10	27	20
Phosphorus, N.E.C.	0	0	364
Potassium	0	3	0
Rags	191	233	325
Rayon or synthetic fibre (fibers burnt)	24	37	10
Rubber clippings	3	7	5
Rubber, scrap or waste	15	14	27
Scrap iron mass	0	0	1
Scrap rubber	1	1	22
Sodium hydrosulphite	16	0	23
Tankage	74	62	96
Waste paper, ground	145	209	124
Waste paper, wet	0	1	1
Wood charcoal	0	2	0
Wool dust	6	1	0
Wool waste	10	11	10
Zinc resinates, fused	0	1	0
Zironium scrap	0	1	0
Poison B			
Anti knock compound	0	0	4
Arsenic acid	0	0	4
Arsenic, crude	0	0	43
Calcium arsenate	0	0	1
Carbolic acid	152	122	147

	Number of Events 1981	 1980	 1979
Poison B (Cont.)			
Chlorinated phenol	1	0	0
Insecticides	8	4	18
Sodium cyanide	15	0	0
Toluene diisocyanate	6	8	11
Corrosive Material			
Acid, N.E.C., dry	5	28	37
Acid, N.E.C., liquid	8	11	1
Acid, propionic	0	7	5
Acid sludge	0	14	12
Alkaline liquid, N.O.S. (Fatty alcohols, etc,)	0	1	0
Amyl phenol	1	1	0
Batteries, electric	1	0	0
Battery sets	2	1	0
Bromine	1	0	0
Butyl phenol	9	45	74
Caustic soda solution spent	8	1	1
Chloral	1	0	1
Cleaning compound, liquid	1	0	0
Compounds, water system	0	1	0
Cresylic acid	2	0	0
Diethanolamine	0	5	4
Diethylenetriamine	6	2	0
Electrolyte acid	0	0	2
Hydrochloric (muriatic) acid)	446	441	423

	Number of Events		
	1981	1980	1979
Corrosive Material (Cont.)			
Hydrofluosilicic acid	0	0	11
Iron chloride	7	2	0
Lye, concentrated, N.E.C.	1	0	0
Muriatic acid, spent	2	0	2
Petroleum refinery sulfide waste	1	0	1
Phosphatic fertilizer solution	34	68	69
Phosphoric acid	4	2	29
Phosphorus trichloride	80	86	76
Potassium hydroxide	14	13	19
Rust prev. compound	1	0	0
Sodium aluminate	0	2	0
Sodium hydrosulphide	0	21	6
Sodium hydroxide (caustic sodium)	1345	1524	1612
Sodium hydroxide solution	6	2	0
Sodium hypochlorite	0	0	1
Sulphide waste	37	29	17
Sulphuric acid	233	247	286
Water treatment compounds, liquid	17	20	26
Irritating Materials			
Tear gas candle	1	0	0
Flammable or Combustible Liquids			
Additives, fuel	1	1	1
Adhesives, N.O.S.	1	3	0
Alcohol, contaminated	1	0	0
Alcohol, grape	2	0	0

	Number of Events		
	1981	1980	1979
Flammable or Combustible Liquids (Cont.)			
Alcohol, N.E.C.	22	15	4
Alcohol, N.O.S.	214	303	296
Alcohol, N.O.S. (In bond)	22	63	28
Anti-freeze preparation, liquid	2	4	2
Asphalt tile	0	0	2
Battery box compounds	1	0	0
Brandy, alcoholic	8	5	10
Cement, N.E.C., liquid	1	1	0
Champagne	5	0	0
Coal briquette binder	0	1	0
Coal gas oil	0	1	0
Coal tar	1	0	8
Coal tar oil	2	0	0
Coal tar naphtha	0	1	0
Compounds, waterproofing	15	0	1
Defoaming compound	0	15	13
Degumming compounds	0	1	0
Foot warmer charges	0	0	6
Fuel oil distillate	166	616	626
Ink materials	0	0	1
Insecticide adhesives	0	0	2
Leather bleach	2	1	0
Motor oil, N.O.S.	1	0	0
Naphtha	15	13	28
Paint drier, liquid	3	0	0

	Number of Events		
	1981	1980	1979
Flammable or Combustible Liquids (Cont.)			
Paint oil compounds	1	0	0
Paint, oils, N.E.C.	1	2	0
Petroleum distillate	0	12	0
Petroleum oil, N.E.C.	61	53	90
Petroleum oil residuum	3	3	1
Petroleum, partially refined	3	5	4
Pipeline coating	0	0	1
Plasticizers, paint, lacquer or varnish	123	122	145
Pulp mill liquid	4	6	5
Resin compound	5	5	1
Rosin solution	3	2	13
Rubber preservative	10	8	5
Rubber tire paint	1	0	0
Solvents, paint, lacquer or varnish	5	3	3
Tar coal	0	0	2
Tar, liquid	0	1	1
Top (leather) dressing	4	1	0
Turpentine	13	13	10
Wine (in tank cars)	0	2	2
Wine, N.E.C. (other than in tank cars)	820	970	1063
Wood turpentine	0	0	1
Combustible Liquid			
Alcohol, furfuryl	2	5	7
Alcohol hexyl	45	23	31
Asphalt petroleum mixed	1	0	0

	Number of Events		
	1981	1980	1979
Combustible Liquid (Cont.)			
Biphenyl (diphenyl)	1	1	0
Decyl alcohol	3	2	6
Diisobutyl	0	0	3
Ethylenediamine	11	2	1
Formaldehyde	0	0	2
Glycol ethers	0	0	1
Lubricating oil	37	7	0
Octyl alcohol	306	324	29
Petroleum lubricating oil	74	58	0
Pine oil	0	0	2
Polyethylbenzene	0	1	0
Refined oil, burning or illuminating	0	7	2
Residual fuel oil & bunker C	1968	1981	1345
Tar pine	2	6	8
Wax, N.E.C.	1	0	0
ORM-A			
Maleic acid	5	10	0
Naphthalene	6	12	0
Orthodichlorobenzene	0	6	0
Paradichlorobenzene	0	1	0
Trichloroethylene	13	16	0
ORM-B			
Chemicals, N.E.C. (mixed loads)	16	2	4
Mixed load groceries	31	36	492

	Number of Events 1981	 1980	 1979
ORM-B (Cont.)			
Petroleum refining products	2	9	3
Sodium bisulphite	1	3	2
ORM-E			
Adipic acid	69	150	0
Aluminum sulphate	57	69	0
Ammonium thiocyanate	0	1	0
Disodium phosphate	6	0	0
Sodium alum	1	0	0
Various			
Acid, spent	1	0	1
Acrylates, butyl	14	1	4
Agricultural insecticides	0	1	2
Calcium/lime salts	0	0	4
Chemicals, N.E.C.	254	197	347
Cleaning compound	187	176	22
Compounds, paint	7	12	18
Compounds vulcanizing	0	1	1
Compressed gases, N.E.C.	12	5	3
Cosmetics, N.O.S.	23	64	59
Acids, inorganic	2	1	1
Fire extinguisher	0	0	1
Lacquers	2	0	1
Refrigerators	2	3	2
Sodium salts	6	6	4

	Number of Events 1981	 1980	 1979
Various (Cont.)			
Vermin exterminator	5	5	21
Weed killer	1	5	1
Others			
Cigarettes	137	155	-
Freight forwarder traffic	4	16	-
Shipper association traffic	793	946	-
Freight rate shipments	8146	8047	-
total (This sheet only)	9080	9164	-
	15,130	15,488	15,123

APPENDIX E

STRACHAN SHIPPING COMPANY
HAZARDOUS CARGO CONTROL PROGRAM

STRACHAN SHIPPING COMPANY

HAZARDOUS CARGO CONTROL PROGRAM

PREPARED BY: JOHN FAULK - SAFETY DIRECTOR

I. GENERAL

A. ALL EMPLOYEES SHALL BE INSTRUCTED TO HANDLE HAZARDOUS CARGO WITH EXTREME CARE AND SHALL FOLLOW SPECIFIED HANDLING INSTRUCTIONS.

B. ALL EMPLOYEES SHALL BE INSTRUCTED WHAT TO DO IN THE EVENT OF A SPILL AND SHALL FOLLOW THESE INSTRUCTIONS.

C. THE FOLLOWING ITEMS SHALL BE KEPT AVAILABLE DURING HAZARDOUS CARGO HANDLING OPERATIONS.

1. BAGS OF SAWDUST (MINIMUM 8 BAGS)
2. BAGS OF LIME OR SODA ASH (MINIMUM 6 BAGS)
3. SHOVEL (1 EACH)
4. BROOM (2 EACH)
5. POLYETHYLENE (1 ROLL)
6. DRUM PATCH MATERIAL (1 ROLL)
7. OPEN TOP DRUM WITH LID AND SECURING RING (2 EACH)
8. PERSONAL PROTECTIVE EQUIPMENT
    (a) RUBBER BOOTS (2 PAIR)
    (b) RUBBER GLOVES (2 PAIR)
    (c) CHEMICAL GOGGLES (2 PAIR)
    (d) RESPIRATORS WITH FILTERS FOR CHEMICAL VAPORS.
    (e) DUST MASKS (1 BOX)
    (f) RUBBER SUITS (2 EACH)
    (g) SOAP (2 BARS)
    (h) SELF CONTAINED BREATHING APPARATUS (1 UNIT)

II. RECEIVING

A. WHEN RECEIVING HAZARDOUS CARGO AT A MARINE TERMINAL, STEAMSHIP CLERKS SHALL FOLLOW THESE INSTRUCTIONS.

1. CHECK FOR PROPER PAPERS.
2. CHECK FOR PROPER IDENTIFICATION AND LABELING.
3. CHECK FOR PROPER PACKAGING.
4. CHECK CONDITION OF PACKAGE AND REJECT LEAKING OR BADLY DAMAGED PACKAGES.

B. WHEN HANDLING HAZARDOUS CARGO BEING RECEIVED AT A MARINE TERMINAL, FREIGHT HANDLERS SHALL FOLLOW THESE INSTRUCTIONS.

1. UNLOADING HAZARDOUS CARGO FROM TRUCK TRAILORS (VANS) WITH THE USE OF LIFT MACHINES.
    (a) CHOCK TRUCK WHEELS.
    (b) IF USING RAMP, SECURE TO TRUCK TRAILOR.
    (c) IF USING DOCKPLATE, SECURE IN PLACE.
    (d) IF TRAILOR IS UNHOOKED FROM TRACTOR, SUPPORT FORWARD END OF TRAILOR WITH PALLETS.
    (e) KEEP UNAUTHORIZED PEOPLE OUT OF TRAILOR.
    (f) WATCH OUT FOR CO-WORKERS IN IMMEDIATE AREA.
    (g) OPERATE LIFT MACHINE WITH EXTREME CAUTION.

2. UNLOADING HAZARDOUS CARGO FROM RAIL CARS WITH THE USE OF LIFT MACHINES.
    (a) CHOCK OR LOCK WHEELS OF RAILCAR.
    (b) SECURE DOCKPLATE IN PLACE.
    (c) KEEP UNAUTHORIZED PEOPLE OUT OF RAILCAR.
    (d) WATCH OUT FOR CO-WORKERS IN IMMEDIATE AREA.
    (e) OPERATE LIFT MACHINE WITH EXTREME CAUTION.

III. STORAGE ON WHARF

A. WHEN STORING HAZARDOUS CARGO ON WHARF, FREIGHT HANDLERS SHALL FOLLOW THESE INSTRUCTIONS.

1. PLACE HAZARDOUS CARGO ON GOOD PALLETS AND IN A PROPER MANNER.
2. WHEN LIFT MACHINE BLADES ARE INSERTED IN PALLET, BLADES SHALL BE CHECKED TO MAKE SURE THEY DO NOT EXTEND BEYOND OPPOSITE SIDE OF PALLET. IF BLADES DO EXTEND BEYOND OPPOSITE SIDE OF PALLET, A SPACER SHALL BE FASTENED TO THE BLADES OF THE LIFT MACHINE, ADJACENT TO CARRIAGE, IN ORDER TO CORRECT THIS CONDITION. LIFT MACHINE BLADES EXTENDING THROUGH PALLET LOADS CAN RESULT IN PACKAGES ON OTHER PALLETS BEING PUNCTURED.
3. ONE PALLET LOAD AT A TIME SHALL BE TRANSPORTED FROM TRAILORS (VANS) OR RAILCARS TO STORAGE PLACE ON WHARF. WHILE BEING TRANSPORTED, PALLET LOADS SHALL BE KEPT AS CLOSE AS POSSIBLE TO WHARF FLOOR BUT HIGH ENOUGH TO CLEAR OBSTRUCTIONS.
4. THE ROUTE OF TRAVEL, FROM TRAILORS OR RAILCARS TO STORAGE PLACE ON WHARF, SHALL BE KEPT CLEAR OF OBSTRUCTIONS AND FREE OF ROAD HAZARDS.
5. STORE HAZARDOUS CARGO IN A SAFE MANNER AND PROPER DISTANCE AWAY FROM OTHER NON-COMPATIBLE CARGO.
6. STACK PALLET LOADS OF HAZARDOUS CARGO NO MORE THAN THREE (3) HIGH LEAVING A SMALL SPACE BETWEEN THE ROWS.
7. IF POSSIBLE, DO NOT STORE HAZARDOUS CARGO ADJACENT TO HEAVILY TRAVELED AISLES AND AVOID STORING AT CORNERS OF CROSS ASILES.

IV. LOADING ABOARD VESSELS

A. WHEN LOADING HAZARDOUS CARGO ABOARD VESSELS, LONGSHOREMEN SHALL FOLLOW THESE INSTRUCTIONS.

1. WHEN LIFT MACHINE BLADES ARE INSERTED IN PALLET, BLADES SHALL BE CHECKED TO MAKE SURE THEY DO NOT EXTEND BEYOND OPPOSITE SIDE OF

PALLET. IF BLADES DO EXTEND BEYOND OPPOSITE SIDE OF PALLET, A SPACER SHALL BE FASTENED TO THE BLADES OF THE LIFT MACHINE, ADJACENT TO CARRIAGE, IN ORDER TO CORRECT THIS CONDITION. LIFT MACHINE BLADES EXTENDING THROUGH PALLET LOADS CAN RESULT IN PACKAGES ON OTHER PALLETS BEING PUNCTURED.

2. ONE PALLET LOAD AT A TIME SHALL BE TRANSPORTED FROM PLACE CARGO IS STORED ON WHARF TO ALONGSIDE VESSEL. WHILE BEING TRANSPORTED, PALLET LOADS SHALL BE KEPT AS CLOSE AS POSSIBLE TO WHARF FLOOR BUT HIGH ENOUGH TO CLEAR OBSTRUCTIONS.
3. THE ROUTE OF TRAVEL, FROM PLACE OF STORAGE ON WHARF TO ALONGSIDE THE VESSEL, SHALL BE KEPT CLEAR OF OBSTRUCTIONS AND FREE OF ROAD HAZARDS.
4. HANDLING DRUMS CONTAINING HAZARDOUS MATERIALS.
   - (a) IF NECESSARY TO KNOCK DOWN THE DRUMS, THEY SHALL BE KNOCKED DOWN ON SOMETHING THAT WILL HELP ABSORB THE IMPACT.
   - (b) THE AREA WHERE DRUMS ARE BEING KNOCKED DOWN SHALL BE CHECKED TO MAKE SURE THERE ARE NO PROTRUDING OBJECTS THAT COULD PUNCTURE THE DRUMS.
   - (c) DRUMS SHALL NOT BE KNOCKED DOWN IN A MANNER THAT WILL ALLOW THEM TO STRIKE THE EDGE OF THE PALLET. A DRUM CAN BE DAMAGED, RESULTING IN A LEAK, SHOULD THE DRUM STRIKE THE EDGE OF ONE OF THE PALLETS INNER SUPPORT MEMBERS.
   - (d) IN ORDER TO MAKE IT EASIER FOR KNOCKING DOWN THE DRUMS, A PIECE OF LUMBER (4"X4"X8' OR 4 "X6'X8') CAN BE PLACED ON WHARF FLOOR ADJACENT TO THE CUSHIONED AREA. THE PALLET LOAD CAN THEN BE LOWERED, ON THE PIECE OF LUMBER, SO THAT THE DRUMS ARE TILTED IN THE DIRECTION THEY ARE TO BE KNOCKED DOWN. THE LIFT TRUCK OPERATOR SHALL MAKE SURE THAT THE PALLET IS PROPERLY POSITIONED ON THE LUMBER, BEFORE BACKING AWAY. THE PALLET SHALL BE LOWERED SO THAT IT CONTACTS THE PIECE OF LUMBER APPROXIMATELY SIX INCHES (6") FROM THE EDGE OF THE PALLET ADJACENT TO THE LIFT MACHINE CARRIAGE. IF THE PALLET LOAD IS LOWERED AND IT CONTACTS THE LUMBER NEAR THE MIDDLE OF THE PALLET, THE LOAD CAN TILT THE OPPOSITE WAY, ONCE THE FRONT THREE DRUMS ARE KNOCKED DOWN. IF LOAD TILTS THE OPPOSITE WAY. REMAINING THREE DRUMS CAN FALL AND POSSIBLY BE PUNCTURED SHOULD THEY STRIKE THE LIFT MACHINE.
   - (e) PALLETS SHALL BE CHECKED FOR PROTRUDING NAILS, BOLTS OR OTHER SHARP OBJECTS THAT COULD PUNCTURE THE DRUMS WHILE THEY ARE BEING KNOCKED DOWN. WHEN SHARP OBJECTS ARE NOTICED ON PALLETS. THE DRUMS SHALL BE ROLLED, ON END, TO THE EDGE OF THE PALLET AND THEN KNOCKED DOWN ON THE ADJACENT CUSHIONED FLOOR.
   - (f) IF NECESSARY TO ROLL DRUMS TO A DESIGNATED PLACE OF STOW ON SHIP, WORKERS SHALL BE AWARE OF AND AVOID SHARP OR PROTRUDING OBJECTS THAT CAN PUNCTURE THE DRUMS.
   - (g) THE DRUMS SHALL BE KEPT UNDER CONTROL, AT ALL TIMES, WHILE BEING ROLLED FROM ONE LOCATION TO ANOTHER. PUSHING A DRUM AND ALLOWING IT TO ROLL ON ITS OWN IS PROHIBITED.
   - (h) WHEN HEADING DRUMS, WORKERS SHALL BE AWARE OF AND AVOID SHARP OR PROTRUDING OBJECTS THAT CAN PUNCTURE THE DRUMS.
   - (i) POLYETHYLENE AND PLYWOOD SHALL BE PLACED UNDER EACH TIER OF DRUMS STOWED IN A HATCH.

5. WHEN USING SPRING LOADED DRUM HOOKS
   (a) HOOK-ON-MEN SHALL CHECK THE SPRING LOADED DRUM HOOKS TO MAKE SURE THEY WORK FREELY, ARE PROPERLY ENGAGED, CHAINS ARE NOT TWISTED, AND PINS ARE BOTTOMED ON ALL SHACKLES.
   (b) HOLDMEN SHALL MAKE SURE ALL HOOKS ARE DISENGAGED, AFTER LOAD IS LANDED IN HATCH AND UNHOOKED.
   (c) WINCH/CRANE OPERATOR SHALL HOIST DISENGAGED DRUM HOOKS SLOWLY IN ORDER TO PREVENT FLIPPING A DRUM SHOULD A HOOK GET CAUGHT ON A DRUM'S RIM.
   (d) WHEN DRUMS ARE LINED UP IN TWO ROWS TO BE HOOKED UP, THE DRUMS SHALL BE KEPT CLOSE TOGETHER IN ORDER TO PREVENT THEM FROM COMING HARD TOGETHER WHEN HOISTED. IF A LARGE SPACE IS LEFT BETWEEN THE ROWS OF DRUMS, THEY CAN COME HARD TOGETHER, WHEN HOISTED, RESULTING IN DRUM HOOKS BEING DRIVEN THROUGH THE ENDS OF THE DRUMS.

6. WHEN USING ROBOT
   (a) LOADS SHALL BE PLACED COMPLETELY WITHIN ROBOT AND CENTERED SO THAT THE ROBOT WILL BE LEVEL WHEN HOISTED.
   (b) ALL SAFETY NETS ON ROBOT SHALL BE HOOKED UP BEFORE HOISTING LOAD.
   (c) IF POSSIBLE, ROBOT SHALL BE ATTACHED TO SHIP'S CARGO HANDLING GEAR SO THAT IT HANGS IN A PORT/STARBOARD (ATHWARTSHIP) POSITION.

7. WHEN HOISTING LOADS ON PALLETS
   (a) SPECIAL HAZARDOUS CARGO PALLET BOARD BRIDLE SHALL BE USED.
   (b) PALLETS SHALL BE CHECKED TO MAKE SURE THEY ARE IN GOOD CONDITION.
   (c) ALL NETS, ON SPECIAL HAZARDOUS CARGO PALLET BOARD BRIDLE, SHALL BE ATTACHED BEFORE HOISTING LOADS.

8. STEVEDORE GEAR, USED FOR HANDLING HAZARDOUS CARGO, SHALL BE POSITIVELY ATTACHED TO THE SHIP'S CARGO HOOK. SHACKLES, SAFETY HOOKS AND SAFETY STRAPS ARE ACCEPTABLE.

9. THE SHIP'S WINCHES OR CRANES, AND OTHER SHIP'S CARGO HANDLING GEAR, SHALL BE INSPECTED FOR SAFE AND PROPER OPERATING CONDITION, BEFORE USING.

10. WINCH/CRANE OPERATORS SHALL STAY EXTREMELY ALERT WHILE OPERATING THE SHIP'S CARGO HANDLING GEAR AND SHALL KEEP THE LOADS UNDER CONTROL AT ALL TIMES.

11. WINCH/CRANE OPERATORS SHALL TAKE SIGNALS ONLY FROM DESIGNATED SIGNALMEN.

12. THE SIGNALMAN SHALL STAY IN CLEAR VIEW OF THE LOAD AT ALL TIMES.

13. LOADS SHALL BE HOISTED FROM THE WHARF AND LANDED IN THE HATCH IN A GENTLE MANNER.

14. HAND HOOKS SHALL NOT BE USED BY WORKERS TO HANDLE HAZARDOUS CARGO PACKAGES.

V. SUPERVISORS RESPONSIBILITY

A. EACH STEP OF THE HAZARDOUS CARGO HANDLING OPERATION SHALL BE KEPT UNDER CONSTANT SUPERVISION TO ASSURE THAT THE OPERATION IS BEING CONDUCTED IN A SAFE MANNER AND IN ACCORDANCE WITH THE HAZARDOUS CARGO CONTROL PROGRAM PROCEDURES.

VI. EMERGENCY PROCEDURES TO FOLLOW IN THE EVENT OF A HAZARDOUS CHEMICAL SPILL

A. PERSON IN CHARGE OF HAZARDOUS CARGO HANDLING OPERATION, WHERE SPILL OCCURRS, SHALL IMMEDIATELY NOTIFY RESPONSIBLE COMPANY OFFICIALS. THE PERSON IN CHARGE SHALL ALSO BE RESPONSIBLE FOR SUPERVISING SPILL CLEAN UP OPERATIONS.

B. THE SUPERVISOR'S FIRST CONCERN SHALL BE TO SEE IF ANYONE HAS BEEN CONTAIMINATED WITH THE SPILLED HAZARDOUS CHEMICAL. SHOULD ANYONE BECOME CONTAMINATED, FOLLOW THE FIRST AID INSTRUCTIONS AS LISTED ON THE PACKAGE OR ON THE CHEMICAL'S DATA SHEET. SEND CONTAMINATED PERSON TO HOSPITAL. NOTIFY HOSPITAL EMERGENCY ROOM THAT CONTAMINATED PERSON IS IN ROUTE AND SPECIFY WHAT TYPE CHEMICAL PERSON IS CONTAIMINATED WITH.

C. INSTRUCT WORKERS WHAT TO DO IN THE EVENT OF A SPILL. TYPE OF CHEMICAL WILL DETERMINE PROCEDURES TO FOLLOW.

D. INSTRUCT WORKERS OF THE HAZARDS ASSOCIATED WITH THE CHEMICAL BEING HANDLED.

E. STAY IN CONTACT WITH RESPONSIBLE COMPANY OFFICIALS FOR FURTHER INSTRUCTIONS.

VII. IMPORTANT PHONE NUMBERS

1. AMBULANCE - 835-8548
2. SOUTHERN BAPTIST HOSPITAL - 899-9311
3. U.S. COAST GUARD - 589-7113 (DAY) 589-7101 (NIGHT)
4. NEW ORLEANS FIRE DEPARTMENT - 581-3473
5. HARBOR POLICE - 525-9422
6. CAPTAIN JAMES TOMENY - 527-6781 (WORK) 288-4027 (HOME)
7. LLOYD DIGIOVANNI - 527-6780 (WORK) 393-1850 (HOME)
8. FRED KRAUS - 527-6785 (WORK) 682-2581 (HOME)
9. JOHN FAULK - 527-6782 (WORK) 279-6246 (HOME)
   JOHN FAULK 527-4006 (BEEPER)

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